THE

MINING CONGRESS JOURNAL

NOVEMBER, 1916

VOL. II

No. 11

SAFETY—EFFICIENCY—CONSERVATION

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EXPLOSIVES

FOR ORE MINING

ACTIVELY engaged for over a century in making explosives, the Du Pont Company believes ore mining engineers and miners will find Du Pont Explosives to be best adapted to all kinds of ore mining.

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Our corps of technical experts are at your service to recommend a Du Pont Explosive capable of increasing production, improving working conditions and reducing mining expense.

E. I. du Pont de Nemours & Co.

Powder Makers Since 1802

Wilmington, Delaware

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For Preparation and Handling Coal at the Mine

LINK-BELT machinery is standard among those who investigate and specify the best. Link-Belt Coal Handling equipment stands the test of low operating and maintenance charges, because the operation of many Link-Belt plants today (some of which we built twenty years ago) are as monuments to our careful design and rugged construction.

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The "Ironclad-Exide" Battery

VS.

The Mule

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The Battery Locomotive gets out more coal, gives a much more reliable service and does the work for less money.

"Ironclad-Exide" equipped locomotives have some remarkable records to their credit.

An **"Ironclad-Exide"** Battery on a gathering locomotive in the Pittsburgh district is doing the up-hill work on 12 per cent grades easily and quickly. The locomotive also controls the load going down hill and is saving time and money, coming and going.

The superintendent of one company using eleven locomotives equipped with **"Ironclad-Exide"** Batteries in a mine where the head room is only 36 to 42 inches, says:

"These locomotives will pay for themselves in eighteen months, and after that will show a saving of about $50 per working day over the previous method of hauling."

A battery locomotive with an **"Ironclad-Exide"** battery reduces the cost of haulage in average operation about 1½ cents per ton mile, including maintenance, depreciation and interest charges.

THE ELECTRIC STORAGE BATTERY CO.

MANUFACTURER OF

The "Chloride-Accumulator", The "Tudor Accumulator"
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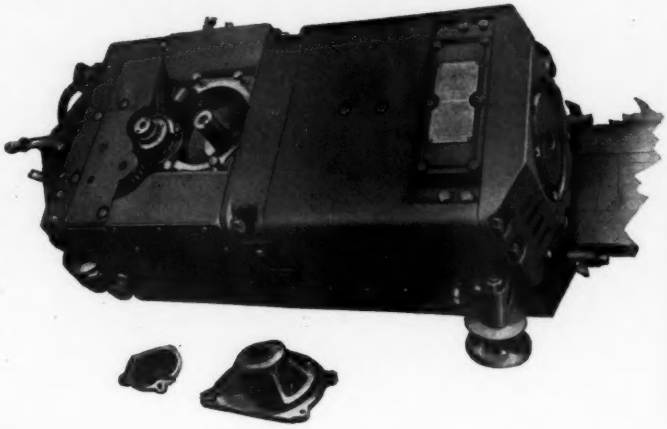
Sullivan "Permissible" Ironclads
For Gassy Coal Mines

Operators of gassy mines may secure the advantage of cutting their coal electrically, without risk of ignition from the machines, by installing *Sullivan Explosion-Proof Ironclads.*



PERMISSIBLE
EXPLOSION PROOF
COAL CUTTING EQUIPMENT
APPROVAL No. 100
ISSUED TO THE
SULLIVAN MACHINERY COMPANY.

CAUTION

The permissibility of this equipment depends upon the absence of any openings in the casings other than those provided with protective devices by the manufacturer.

Cover plates should be screwed on tight and the casings frequently inspected for improper openings.

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The United States Bureau of Mines has tested these machines rigorously over long periods, and as a result, has issued its formal approval of this model. The Government Approval Plate and caution shown by the cut is attached to each Sullivan Machine of this type.

> *Ironclads are the only Coal Cutters that have received the Government approval as "Permissible" or "Explosion Proof."*

Standard Ironclads, as now furnished, may be converted in the field into "Permissible" machines, should gas develop, by adding the protective devices, furnished by this company, which carry with them the right to affix the Government Approval Plate. Complete description of Explosion Motors, and of the methods used in testing furnished on application. Bulletin 35,101.

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The American Mining Congress

The American Mining Congress is a voluntary association supported by the dues and fees of its members. It is striving to bring about:

First—Safety and efficiency in mining operations.

Second—Intelligent conservation with a view to the highest development and use of our mineral resources.

Third—The stimulation of investment in practical mining operations by showing that mining is a legitimate business when intelligently conducted.

Fourth—Uniformity in state laws governing mining operations carried on under like conditions.

Fifth—Such federal co-operation through research and investigation as will furnish the basis for intelligent state legislation, and will solve those problems of economical production, treatment and transportation which are essential to an increase in mineral production.

Sixth—The improvement of the economic conditions underlying the coal mining industry.

If you are interested in this work, now is the time to help; do not wait until those who are now carrying the burden have become discouraged.

The appended application blank will show the way. Come in and bring the neighbor who should join this movement. Mail application to

THE AMERICAN MINING CONGRESS

Munsey Building, Washington, D. C.

THE AMERICAN MINING CONGRESS

APPLICATION FOR MEMBERSHIP

.....191.....

I hereby make application for membership in THE AMERICAN MINING CONGRESS and agree, if accepted, to abide by the By-Laws, Rules and Regulations of said organization and to pay the dues required by same.

Name.....

Occupation.....

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To the Members of the American Mining Congress:

Do you know that you are the owners and publishers of the MINING CONGRESS JOURNAL? We trust you will realize the responsibility of this ownership and that you will lend your active assistance in making the Journal a greater success.

Real mining men should be active members. An application blank will be found on another page of this issue.

Associate memberships are designed for those not actively interested in mining, but who are willing to assist a state Chapter of the Mining Congress in helping to develop the Mining industry within the State. All memberships include subscription to the MINING CONGRESS JOURNAL.

Every member of the Mining Congress should undertake to send in at least one application each month. Will you help by having the following blank filled in and mail to this office?

SUBSCRIPTION AND APPLICATION FOR ASSOCIATE MEMBERSHIP
IN THE
AMERICAN MINING CONGRESS

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I hereby make application for Associate Membership in THE AMERICAN MINING CONGRESS, and agree, if accepted, to abide by the By-Laws, Rules and Regulations of said organization and to pay the dues required by same. Herewith find $1.00 fee and $1.00 dues for one year, including subscription to the Mining Congress Journal ($1.00 of which is designated as subscription to Journal).

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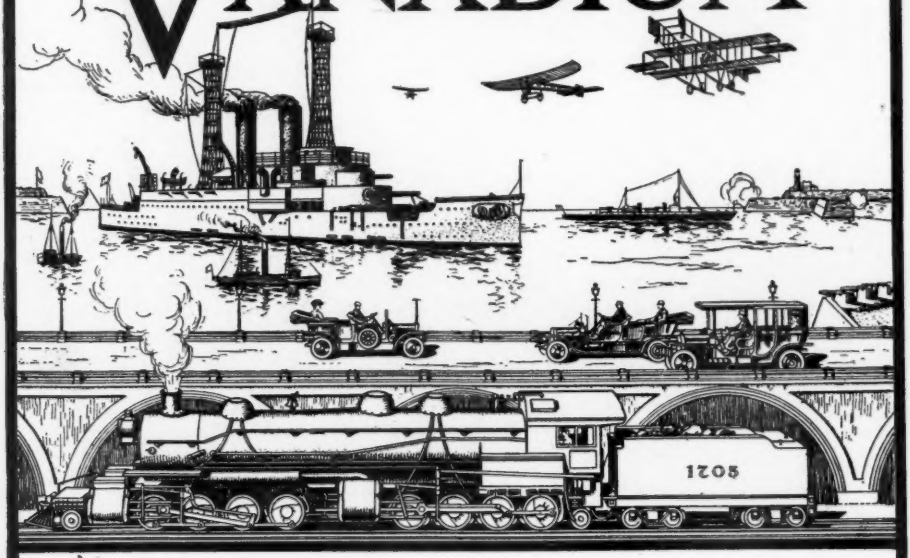

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Maximum Strength

With

Minimum Weight

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VANADIUM STEEL

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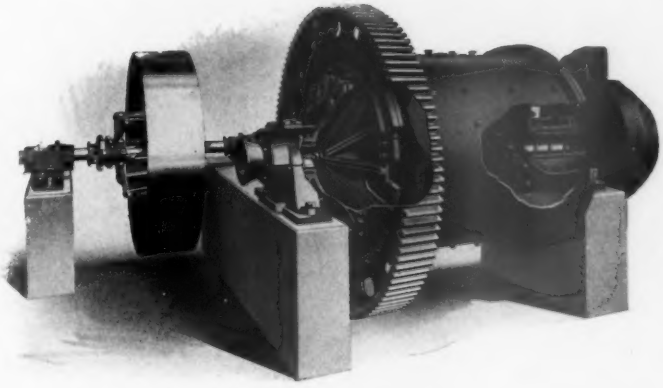

Allis-Chalmers Ball Granulator
Sectional View

Capacity, 500 Tons, 24 Hours

Size, 6 by 5 feet **HP., 45**

Charge of Balls, 9,000 pounds

Material, Very Hard **Moisture, 59.2 per cent**

Steel Consumption Per Ton Ore

Lining .2 pound **Ball, .477 pound**

SCREEN ANALYSIS

Mesh	Feed	Product
Through 1″ on ½″	26.12%	
Through ½″ on ¼″	39.09	0.57%
Through ¼″ on 6 mesh	8.71	1.57
Through 6 mesh on 8 mesh	5.12	2.56
Through 8 mesh on 10 mesh	3.58	4.49
Through 10 mesh on 20 mesh	6.80	10.18
Through 20 mesh on 40 mesh	.23	12.39
Through 40 mesh on 60 mesh	1.46	11.32
Through 60 mesh on 100 mesh	2.25	11.46
Through 100 mesh on 200 mesh	3.10	17.24
Through 200 mesh	7.54	28.22

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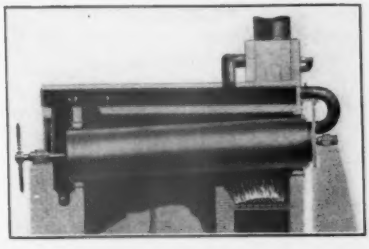

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PROVISIONAL PROGRAM

SUBJECT TO REVISION

Nineteenth Annual Session

OF

The American Mining Congress

CHICAGO, ILLINOIS

November 13-16, 1916

OFFICIAL HEADQUARTERS AT THE LA SALLE HOTEL

GENERAL SESSIONS

Note—Those marked with (*) have not definitely decided to be present.

MONDAY, NOVEMBER 13, 2 P. M.

Convention called to order at 2 p. m. by HARRY C. ADAMS, *Chairman, Committee of Arrangements.*
Invocation—REV. FRANK W. GUNSAULUS, Chicago, Ill.
Address of Welcome—HON. EDWARD F. DUNNE, *Governor of Illinois.*
Address of Welcome—HON. WM. H. THOMPSON, *Mayor of Chicago.*
Address of Welcome—J. W. O'LEARY, *President, Chicago Association of Commerce.*
Response to Addresses of Welcome—

Three-minute responses by representatives of the several States, each with resolution embracing State's most important mining issue.

TUESDAY, NOVEMBER 14, 10 A. M.

CARL SCHOLZ, Presiding; C. S. KEITH, Alternate Chairman.

Subject—"Safety in Mining Operations."
Introduction of Resolutions.
Address—"The Record of Mine Safety Work"—ALBERT H. FAY, *U. S. Bureau of Mines.*
Address—"State Mine Rescue Methods"—DR. H. H. STOEK, Urbana, Ill.
Address—"Safety Work as an Investment"—C. W. GOODALE, Butte, Mont.
Address—"Responsibilities and the Duties of the Operator"—*THOMAS M. GANN, Knoxville, Tenn.
Address—"Of the Miner"—DAVID ROSS, Springfield, Ill.
Address—"Of the Public"—*JUDGE W. D. HOAG, Joplin, Mo.
Open discussion under 10-minute rule.
Selection of Committee on Resolutions.
Recess.

TUESDAY, NOVEMBER 14, 8 P. M.

Annual members' meeting for the election of directors and the transaction of routine business.

GENERAL MEETINGS

MONDAY, NOVEMBER 13, 8 P. M.

SIDNEY NORMAN, Spokane, Wash., Presiding.

Illustrated Lecture—"Mining in the Arctic Regions of Alaska and Siberia"—DR. HENRY MACE PAYNE, New York City.

Illustrated Lecture (Moving)—"The Cerro Azul Gusher"—E. L. DOHENY, Los Angeles, Cal.

WEDNESDAY, NOVEMBER 15, 9 A. M.

HENNEN JENNINGS, Presiding; DR. JAS. E. TALMAGE, Alternate Chairman.

Subject—"Efficiency in Mining Operations."

10 a. m.—Introduction of Resolutions.

Report—Committee on Relations with Federal Trade Commission—CHARLES M. MODERWELL, *Chairman*, Chicago, Ill.

Address—"Federal Aid to Mining Efficiency"—VAN H. MANNING.

Address—"The Federal Trade Commission and the Mining Industry"—HON. E. N. HURLEY, Washington, D. C.

Address—"Industrial Cooperation Under the Sherman Law"—*GLEN W. TRAER, Chicago, Ill.

Address—"The Sherman Law and Its Relation to Mining"—To be selected.

Address—"Efficiency in Ore Treatment"—*E. P. MATHEWSON, Anaconda, Mont.

Discussion.

THURSDAY, NOVEMBER 16, 9 A. M.

WALTER DOUGLAS, Presiding; S. A. TAYLOR, Alternate Chairman.

Subject—"Conservation."

10 a. m.—Introduction of Resolutions.

Report—Committee on Forest Relations—CARNEY HARTLEY, Denver, Colo., *Chairman.*

Address—"Conservation: Its Purpose, Its Effect, and Who Should Pay for It"—To be selected.

Address—"Conservation in Mining Through Water Power Development"—CHARLES F. POTTER, Los Angeles, Cal.

Address—"Waste in the Mining Industry; In Mining; In Distribution and in Use; and the Relation of These Wastes to the Operator, the Consumer, and the Public"—To be selected.

Address—"The State Geologist and Conservation"—DR. A. H. PURDUE, Nashville, Tenn.

Address—"X-ray Development"—DR. W. R. WHITNEY, Schenectady, N. Y.

Address—"The New Things in Science"—DR. F. G. COTTRELL, San Francisco, Cal.

THURSDAY, NOVEMBER 16, 8 P. M.

BANQUET

Address—"Cooperation, the Basis of Safety, Efficiency and Conservation in the Use of the Nation's Mineral Resources"—CARL SCHOLZ, Chicago.

Address—"Organized Capital and Organized Labor and Their Relation to Efficiency, Conservation, Better Wages, Better Living Conditions, Lawlessness, Strike Disorders, and Industrial Freedom"—COL. GEORGE POPE, Hartford, Conn.

Address—"What the MINING CONGRESS JOURNAL is Doing for the Mining Industry"—PAUL WOOTON, Washington, D. C.

FRIDAY, NOVEMBER 17, 9 A. M.

Excursion to Gary, Ind.

METALLIFEROUS SECTION

TUESDAY, NOVEMBER 14, 2 P. M.

IRVING T. SNYDER, Denver, Presiding; GEORGE E. COLLINS, Alternate Chairman.
Address—"The World's Gold Supply and Its Sufficiency for Business Needs"—DR. WALDEMER LINDGREN, Boston, Mass.
Address—"The Mining Industry"—C. A. TUPPER, Chicago, Ill.
Address—"The Lead and Zinc Resources of the United States"—C. E. SIEBENTHAL, *U. S. Geological Survey*, Washington, D. C.
Address—"A Tariff for Revenue as Related to a Compensating Duty on Lead and Zinc Ores"—OTTO RUHL, Joplin, Mo.
Address—"The Copper Resources of the United States"—WALTER HARVEY WEED, New York City.

WEDNESDAY, NOVEMBER 15, 2 P. M.

WILL L. CLARK, Presiding.
Topic—"Mine Manufacturing the Best Industry of the Rocky Mountain West"—*JOHN HAYS HAMMOND, New York City.
Address—"How to Protect the Small Investor in Metalliferous Mines"—HON. W. R. ALLEN, Butte, Mont.
Address—"Smelter Contracts and Market Quotations"—R. M. HENDERSON, Breckenridge, Colo.
Address—"Copper in Its Relation to Preparedness and Industrial Efficiency"—To be selected.
Address—"The Marketing of Zinc Ores"—W. B. SHACKELFORD, Webb City, Mo.
Address—"Oil Flotation"—DORSEY A. LYON, Salt Lake City.
Address—"Cooperation in the Lead and Zinc Industry."
Open discussion under 5-minute rule.

THURSDAY, NOVEMBER 16, 2 P. M.

D. W. BRUNTON, Denver, Presiding; W. B. SHACKELFORD, Alternate Chairman.
Report—Committee on Revision of Mineral Land Laws"—E. B. KIRBY, New York, *Chairman.*
Address—"The Foster Bill"—DR. M. D. FOSTER, *Chairman House Committee on Mines and Mining.*
Address—"The Revision of Mining Laws," HON. CHAS. S. THOMAS, *U. S. Senator from Colorado*—*FRANK L. PECKHAM, Washington, D. C.
General discussion.
Address—"The Rare Metals"—DR. R. B. MOORE, Denver, Colo.
Address—"The Prospector and the Apex Law"—THEO. F. VAN WAGONEN, Denver, Colo.
Address—"Workmen's Compensation in the Metalliferous Mining Industry"—*HON. THOMAS KEARNS, Salt Lake City, Utah.
Address—"Electrolytic Separation"—FRED LAIST, Anaconda, Mont.

OIL AND GAS SECTION

TUESDAY, NOVEMBER 14, 2 P. M.

RALPH ARNOLD, New York City, Presiding.
Address—"The Oil Resources of the United States"—W. A. WILLIAMS, *U. S. Bureau of Mines.*

Address—"The Authority of States to Tax Production from Indian Lands"—Hon. J. G. Gamble, *Assistant Attorney C. R. I. & P. R. R.*, Des Moines, Iowa.
Address—"Oil Land Withdrawals"—Judge George H. Patrick, Washington, D. C.
Address—"The Relation of the Federal Government to Western Oil Production"—Gov. James N. Gillet, San Francisco.
Address—"The Federal Government and the California Oil Claimants"—Hon. Jas. D. Phelan, *Senator*, California.
Discussion—Led by Thomas A. O'Donnell, Los Angeles, Calif.

WEDNESDAY, NOVEMBER 15, 2 P. M.

Dr. Norman Bridge, Los Angeles, Cal., Presiding.
Address—"Geology in Its Relation to the Oil Industry"—J. C. McDowell, Pittsburgh, Pa.
Address—"Standardization of Oil Testing Methods"—*W. H. Fehsenfeld, Baltimore, Md.
Address—"The Future of the Dye Industry through the Use of Petroleum"—Dr. Walter F. Rittman, Empire Building, Pittsburgh.
Address—"Practical Phases of the Standard Oil Dissolution, and the Necessity of Combinations Among Independent Producers to Meet Unfair Competition"—R. L. Welsh, Chicago, Ill.
Address—"Federal Cooperation with the Oil Industry"—H. G. James, Kansas City, Mo.

THURSDAY, NOVEMBER 16, 2 P. M.

S. Y. Ramage, Oil City, Pa., Presiding.
Address—"The World's Oil Supply"—Ralph Arnold, New York City.
Address—"Naval Oil Reserves as a Necessity to National Preparedness"—To be selected.
Address—"The Future of the Natural Gas Industry"—*Judge Thomas J. Flannelly, Independence, Kans.
Address—"The Relation of the Federal Government to Scientific Research in the Oil and Gas Industry"—To be supplied.
Address—"Modern Oil Storage"—To be supplied.
Discussion—Led by Alf. G. Heggem, Tulsa, Okla.
Address—"The Chemical Possibilities of Petroleum"—Dr. David T. Day, Washington, D. C.

COAL SECTION

MONDAY, NOVEMBER 13, 9 A. M.

Call for Conference—R. J. Wilson.
Reasons for Calling Conference—J. G. Grossberg.
"What Can Uniform Legislation Hope to Accomplish?"—Van H. Manning.

MONDAY, NOVEMBER 13, 2 P. M.

Address—"Advisability of Preparing Mining Legislation through Commissions"—S. A. Taylor.

Address—"Commission Plan in Ohio"—E. WOODFORD.
Address—"Commission Plan in Illinois"—A. J. MOORSHEAD.
Address—"Desirable Points of Similarity"—J. E. WILLIAMS.

TUESDAY, NOVEMBER 14, 2 P. M.

C. M. MODERWELL, Chicago, Presiding.

Report—Committee on Uniform Cost Accounting System—S. A. TAYLOR, Pittsburgh, *Chairman.*
Address—"Cooperation in the Marketing of Coal"—RALPH CREWS, Chicago, Ill.
Discussion under 10-minute rule—C. P. WHITE, Cleveland, Ohio; C. G. HALL, Terre Haute, Ind.; R. A. HORD, Lexington, Ky.; W. P. DEARMIT, Pittsburgh, Pa.; G. H. BARKER, Columbus, Ohio; W. H. HUFF, Denver, Colo.; H. N. TAYLOR, Kansas City, Mo.; W. J. SPENCER, Brereton, Ill.; JAS. E. MCCOY, Knoxville, Tenn.; T. L. LEWIS, Charleston, W. Va.; W. W. BRIDGES, Drakesboro, Ky.; W. H. CUNNINGHAM, Ashland, Ky.
Open discussion under 5-minute rule.
Report—Committee on Workmen's Compensation—T. L. LEWIS, Charleston, W. Va., *Chairman.*
Address—"The Cost of Coal"—GEORGE OTIS SMITH and C. E. LESHER, *U. S. Geological Survey.*
Address—"New Ideas in the Preparation of Eastern Coal"—*WARREN ROBERTS, Chicago, Ill.
Address—"The Disadvantage of Wildly Fluctuating Coal Prices"—J. C. KOLSEM, Terre Haute, Ind.; D. J. JORDAN, Oklahoma City, Okla.; JOHN LAING, Charleston, W. Va.
Address—"Relation of the Federal Government to Uniform State Legislation"—REPRESENTATIVE M. D. FOSTER.
Address—"Uniformity in Miners' Certificate Laws"—H. FISHWICK.
Address—"Uniform Compensation Laws"—K. N. MEGUIRE.

TUESDAY, NOVEMBER 14, 8 P. M.

Address—"Suggestions Regarding the Unifying of State Laws"—J. W. THOMPSON.
Address—"To What Extent Is It Advisable to Control Mining Operations by General Laws?"—R. A. SHIFLETT.
Address—"Coal Freight Rates Relativity and Uniformity"—R. W. ROPIEQUET.

WEDNESDAY, NOVEMBER 15, 2 P. M.

DR. I. C. WHITE, Morgantown, W. Va., Presiding.

Address—"The Colorado Industrial Commission"—WAYNE WILLIAMS, Denver, Colo.
Address—"Cooperation in the Coal Industry"—H. E. WILLARD, Cleveland, Ohio.
Address—"The Duties of Mine Inspectors"—J. W. PAUL, Pittsburgh, Pa.
Address—"The Closed Shop and the Check-off as Related to Efficiency in Mining Operations"—DORSET CARTER, Oklahoma City, Okla.
Address—"What Becomes of the Benefits of Production Efficiency"—GEORGE H. CUSHING, Chicago, Ill.
Address—"The Influence of Inter-district Competition on Economy in Southwestern Coal Production"—*J. G. PUTERBAUGH, McAlester, Okla.; *HARRY N. TAYLOR, Kansas City, Mo.
Address—"Cohesion Among Coal Operators"—*THOMAS T. BREWSTER, St. Louis, Mo.
Address—"The Experience of Anthracite Operators in Storing Coal to Equalize Production"—*E. W. PARKER, Wilkes-Barre, Pa.

Address—"The Federal Trade Commission and Uniform Mining Legislation"—E. N. HURLEY.
Address—"Uniform Mining Laws as Affecting Safety First"—E. O'TOOLE.
Address—"Uniform Legislation as Related to the Mine Inspection Service"—JOHN BOHLANDER.
Address—"Uniform Legislation as Affecting Mining Engineering"—J. A. GARCIA.

THURSDAY, NOVEMBER 16, 2 P. M.

J. C. KOLSEM, Terre Haute, Ind., Presiding.

Address—"Coal and Its By-Products"—ALFRED M. OGLE, Terre Haute, Ind.
Address—"Two Years' Experience in the World's Coal Markets and Its Lesson"—*F. S. LANDSTREET, New York City.
Discussion.
Address—"After the Association, What?"—W. S. BOGLE, Chicago, Ill.
Address—"Unequal Distribution of Bituminous Coal and Its Cost to Operator, Retailer and Consumer"—*K. N. MEGUIRE, Louisville, Ky.
Address—"Wasteful Methods of Coal Distribution"—*CHAS. L. DERING, Chicago, Ill.
Address—"Difficulties I Have Met in Coal Litigation and the Remedies"—*R. W. ROPIEQUET, Belleville, Ind.
Address—"The Future of Coal Export Industry and the Necessities for Its Success"—*J. A. RENEHAN, New York City.

PUBLIC LANDS SECTION

No set program will be provided for this section.
It will be composed of three special delegates from each of the Public Land States appointed by the Governors, under instructions to sit in conference and to devise a Western Public Lands Policy. To formulate the most comprehensive policy which can meet general approval.

UNIFORM COAL MINING LAW SECTION

The program for this section is being prepared by the Mining Investigation Commission of the State of Illinois and will consist of special delegations appointed by the Governors of the coal producing States. This conference was called by Governor Edward F. Dunne, of Illinois, at the request of the Commission, and will meet in conjuction with the American Mining Congress Convention.
Its purpose is a discussion of Uniform Mining Legislation in the Coal Mining States.

WHAT PRESIDENT WILSON THINKS OF THE MINING CONGRESS

From the message of President Woodrow Wilson to the eighteenth annual convention of the American Mining Congress, held at San Francisco.

It will always be a tribute to your foresight and energy that while this new Bureau of Mines in the short period of its existence, with the kindly cooperation of State and other agencies, has been able, by persistent and intelligent effort, to turn an isolated, local movement for greater safety into a great national movement for "Safety First," that has already gone beyond the mine industry into every industry of the country. I venture to say that thousands of lives have been saved by that movement, and that many thousands more will be saved in the future.

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GEORGE OTIS SMITH

Director of the United States Geological Survey, who will discuss some of the possibilities of Government operations of coal mines in an address at the Mining Congress Convention.

VOL. 2, NO. 11 WASHINGTON NOVEMBER, 1916

THE MINING CONGRESS JOURNAL

Official Organ of the American Mining Congress

VITAL ISSUES TO COME UP AT CONVENTION OF MINERS

In this issue we have much to say of the American Mining Congress, of its past and of its present. The occasion—its nineteenth annual convention which begins in Chicago November 13—warrants some little effusiveness, some little congratulation on what it has accomplished and is accomplishing.

For it is at its great annual conventions that it debates its great issues, summarizes its purposes and resolves upon betterments for the mining industry.

It is clear that so great a task requires not alone the best minds in all branches of the mining industry, but the greatest possible number of men who have given thought to the subjects that are for our joint interest.

And above all it is almost imperative that every mining section in the country be represented, for it is only by knowing all the local conditions that we can act intelligently for the general good.

As an example we call attention to the discussion on "Revision of the Mining Laws" which is to be a notable feature of the convention. While we will have this topic discussed by the Chairman of the House Committee on Mines and Mining, Dr. M. D. Foster, and papers by so great a mining lawyer as U. S. Senator Charles S. Thomas, and so eminent a mining engineer as Theodore Van Wagenan, of Colorado, yet there is such a wide divergence of opinion, many local conditions operating for or against certain vital contentions, that every mining section of the country should be represented in order that the best possible plan of action shall be provided.

This is pertinent also to the discussion on a "Public Lands" policy as it concerns the mining man. Here surely the need of representative opinion lies on the surface, for this is distinctly a western question on which the East requires enlightenment. And it is hoped that every delegate named by the governors to this particular conference will be on hand to aid in formulating a comprehensive western policy. In view of the present legislative situation at Washington we feel that the time is opportune for a campaign to reopen mineral resources to development, to protect the interests of the States, to meet the eastern criticism against fuel and power monopoly, and to work out the conservation that stands for the highest use and the least possible economical waste of the great mineral resources of the West.

These are but two of the many topics which will come before this convention and which will need the presence and the views of every delegate, of every regular member of the Congress, and of all those who are interested in seeing the mining industry uplifted by the influence and the power of united action.

But the benefits of attendance on this convention are not altogether general. There are phases in which the profits strike home at once to the individual and to his business.

For example, there is the topic of "Co-operation in the Marketing of Coal," the initial paper on which will be read by Ralph Crews, of Chicago, largely concerned in developing the Franklin County plan, on which nearly a score of like associations have been formed. For the discussion of this important subject invitations have been sent to and ac-

cepted by the secretaries of practically all these organizations.

It is evident, therefore, that every man to whom this subject is of vital interest in his business should not let the opportunity pass of attending and of aiding in the debate.

EFFICIENCY A NECESSITY

The greatest problem of statesmanship is to create conditions under which all may have opportunity to prosper, and all may find lucrative employment. No other condition will prevent want, and starvation is not conducive to a proper respect for law, for property, or for the rights of others. The nation's workers cannot be employed unless there is a market in which the product of that labor can be sold. In a country like the United States, where the productive capacity is in excess of the possible home consumption, there must be an outlet in foreign markets for the surplus production, else, to the extent of the labor required for that surplus production, there must be idleness.

In an address before the third annual National Foreign Trade Convention, Mr. Bernard Suttler, Editor of the Iron Tradesman, Atlanta, Ga., made the following statement: "I have observed this to be true, that whenever the export product falls below $2,000,000,000 a year, or 5 per cent of our total product, we have hard times and our factories are closed down. When it runs to two and a half billions a year, we have a normal business, and when it runs to three billions a year we have a business boom. Therefore, you may say that when we sell abroad 7½ per cent of our annual product, we have thereby created a balance wheel which keeps the various parts of the machine going. Now, as to how we are going to get that product abroad is, of course, a problem we must endeavor to solve.

"In order that we may sell the surplus goods, the cost of this surplus product plus the cost of transportation to foreign markets must not be more than the selling price of similar competitive goods in such market. Given similar quality and cost, superior salesmanship may command the market, but selling efficiency cannot entirely overcome the handicap of excess production cost."

THE MINING CONGRESS JOURNAL advocates the highest possible wage, but at the same time it insists that the highest efficiency must be attained in order that our surplus may find a market. The present rapidly increasing price average on all products will be a great and perhaps an insurmountable obstacle when world conditions shall again become normal. The fight for efficiency is daily becoming of greater importance to all classes and particularly to labor.

ONLY REPUTABLE FIRMS ALLOWED TO ADVERTISE

It is within the power of each member of the American Mining Congress to be a great help to the Congress if they will patronize those who advertise in their Journal. No one but a reputable dealer can buy space in THE MINING CONGRESS JOURNAL. Each advertisement is scrutinized with the same care as the matter which enters into its news columns.

It does not require additional effort to mention, when placing orders, that you have noticed an advertisement of the firm with which the order is being placed, in THE MINING CONGRESS JOURNAL. Many a contract for advertising has been renewed on the strength of a single order which could be identified as return from advertising. We know that the advertisements in this paper are read. We know that the members of the American Mining Congress are doing hundreds of thousands of dollars worth of business with firms whose advertisements appear in this issue. Since the Journal is your property, and any income that may be derived from it goes into the most efficient work that is being done in the interest of the mining industry, we believe it is not asking too much that members give us this additional measure of co-operation.

BIG THINGS BEING DONE BY COOPERATIVE EFFORT

There is what one might term a "common denominator" for every branch of the mining industry—those who mine, those who use mine products—those who transport the production of the mines—those who furnish machinery or supplies.

And that "common denominator" or "mutual interest" applies whether you are a "coal" man, an "oil" man, a "zinc," "lead," "copper," "gold" or "silver" man.

And that converging point where your interest becomes the interest of every other mining man and mining industry is where the American Mining Congress steps in, outlines your joint plans and ideas and fights tooth and nail for them.

The first big thing we accomplished by standing and working together was the establishment of the U. S. Bureau of Mines.

The next big thing we helped to effect was the passage of the most important "safety" legislation of a century and the inspiration of the entire "Safety First" movement in the biggest industry of the country.

Then came its report on Prevention of Mine Accidents," which is now of international import. Then a successful fight for the protection of mining investors—little and big—so that all the facts about the proposition into which they put their money may be known to them.

The Mining Congress had a hand in securing the elimination of the tax on copper in the recent revenue bill and in preventing the application of special taxes to other metals.

Its work on "Standardization of Electrical Equipment in Mines" is a recognized standard in the mining industry—both coal and metal, today.

Now it is busy fighting along every "mutal" line:

For a revision of mining laws.

For larger appropriations by Congress that we may have an extension of Government service along lines to assist practical men in developing the mining districts of the country.

For a public lands policy that spells "development" in the mining sections of the land.

For such cooperation as will enable the operator to pay proper wages to labor, furnish his produce to the consumer at a proper price, and still obtain a fair profit for his capital and enterprise.

These are some of the reasons why it needs your help and why you should join THE AMERICAN MINING CONGRESS.

BUREAU OF MINES HAS EXHIBIT AT NEW YORK CHEMICAL SHOW

The Bureau of Mines participated in the National Exposition of Chemical Industries held at the Grand Central Palace in New York City during the week of September 25.

The space occupied by the Bureau was 100 by 20 feet. The exhibit consisted of five dummy figures representing miners wearing various types of rescue apparatus and otherwise fully equipped for mine rescue work, white chinaware made from all-American materials that had been purified by methods devised by the Bureau of Mines; a model showing the evolution of coal, Bureau of Mines oxygen resuscitator, the lungmotor, Westphalia reviving apparatus, a complete set of miners' electric and oil safety lamps, a working model of an automatic mine door, a Burrell gas detector, Bureau of Mines tool kit, oxygen bird cage, Bureau of Mines first-aid cabinet and surgeons' chest, a set of flash-point testers and scientific instruments used by the Bureau in its laboratories, a Houser automatic analytical scale, several types of fresh-air helmets, several types of ammonia helmets, sandblast and acid-proof helmets, together with several types of arc-weld helmets, and gas masks such as are used in warfare in Europe.

On the walls were large charts of mining statistics, and a set of safety symbols for use in mines. Samples of carnotite and pitchblende ores were also shown, with an electroscope for determining the radium content of these ores.

During the week nearly 90,000 persons visited the exhibit, among whom were many of the foremost engineers and chemists of the country. The exhibit was installed and was in charge of M. F. Leopold, of the Washington office, assisted by H. J. Nichols.

George Otis Smith, director of the U. S. Geological Survey, expects to be in Maine the week following his attendance at the Chicago convention of the Mining Congress, and will speak in Skowhegan, Me., at a citizens' meeting, November 19, on "Prohibition as a National Issue, and on November 21, before the Sorosis, on "Your Share of the Nation's Wealth."

EVERY MINING STATE IN THE UNION WILL BE STRONGLY REPRESENTED AT CONVENTION

American Mining Congress Meeting to be Held in Chicago the Week of November 13, Will Be Greatest Gathering of Mining Men Under One Roof in the History of the Industry—President Names Representative Delegates

A delegation from every mining State in America and representatives from every important mining section of the country will be in attendance when the American Mining Congress Convention opens in Chicago, November 13.

President Wilson has notified Secretary J. F. Callbreath of his appointment of the following delegates: E. H. Benjamin, Oakland, Calif.; H. M. Chance, Philadelphia; Curtis H. Lindley, San Francisco; James MacNaughton, Calumet, Mich.; Van H. Manning, Washington; E. P. Mathewson, Anaconda, Mont.; Charles Piez, Chicago; W. L. Saunders, New York; George Otis Smith, Washington, D. C., and A. H. Woodward, Woodward, Ala.

The conference of coal mining men from the Middle West called by Governor Dunne will be held in conjunction with the Congress. Its conclusions, particularly in matters pertaining to uniformity of laws, will be of national interest.

Wherever possible the railroads have granted a special rate. In Western Passenger Association territory where the rates approximate to 2 cents a mile no further concessions are made to any gatherings. From California and Pacific Coast common points the information is given out that the nine-months tourist rate of one and one-third fares to Chicago and return applies for the period of the sessions of the American Mining Congress.

The Central Passenger Association, which covers common points in Illinois, Indiana, Ohio, Pennsylvania, West Virginia, Michigan, Eastern Missouri, Western New York, has made a 2 cent rate each way. These tickets will be sold November 11, 12 and 13. They have a return limit to November 20. Holders must reach their original starting point before midnight of November 20.

The special sessions in the interest of a western public lands policy will form a most important part of the Congress. Governor Geo. W. P. Hunt, of Ariz., in a letter on this subject, says: "This matter is of such importance that it merits serious attention from each of the western States." Governor Kendrick, of Wyoming, is "of the opinion that such a convention will do much to bring to the attention of the press and public this important work."

"The great difficulty," says James F. Callbreath, Secretary of the American Mining Congress, who is organizing the conference, "has been that the West has had no comprehensive policy, and even western representatives in Congress could not get together upon an intelligent plan for handling this question. The conference will be the means through which we will arrive at a practical solution of the public land problem.

"The belief that the resources which are essential to industrial prosperity should not be permitted to pass beyond public regulation must be considered, but it must also be recognized that the individual States must have the benefit of their own natural resources.

"In view of the present legislative situation at Washington, I feel that the conference is opportune and that it will begin a campaign to reopen mineral resources to development, to protect the interests of the States, to meet the eastern criticism against fuel and power monopoly and to work out the conservation that stands for the highest use and the least possible economical waste of the great mineral resources of the West."

The exhibit, which will take up the seventeenth floor of the hotel, with the exception of two meeting rooms, is now an assured success. Arizona has taken two of the larger spaces for its exhibit. The University of Illinois is preparing a fine educational photographic display. The U. S. Bureau of Mines exhibit, now at Detroit, will be shown and will be one of the main educational features on the floor. H. R. Ameling, of St. Louis, has engaged one of the larger rooms to show twice or three times daily, with moving pictures, the operation of the core drill. Roebling, the Goodman Manufacturing Company, the General Electric, the Justrite Manufacturing Company, Macomber & White, Stephens Adamson, the Link Belt, the Electric Storage Battery Company, of Philadelphia; Stromberg-Carlson, G. L. Simonds, and the Tool Steel Gear & Pinion Company all promise thoroughly representative exhibits. The Mining World, The Engineering and Mining Journal, The Mining and Scientific Press, The Coal Age, and The Black Diamond are among the first of the trade papers to arrange for space.

Particularly interesting will be the discussions on topics pertaining to the oil industry. There will be several interesting papers on the oil resources of the country. In a letter congratulating the Congress on its "oil" program, Rear Admiral John R. Edwards, U. S. N., writing from his home at Bristol, R. I., to Secretary Callbreath, sounds a new note in the country's industrial "preparedness" program.

CARL SCHOLZ
President, American Mining Congress

"The extensive oil shale deposits of the Rocky Mountain region" says the admiral, "offer, far-reaching possibilities to the industrial and maritime interests as well as to the military departments of the nation, and the action of the Mining Congress in giving special consideration to the question is another instance where the engineer is preparing to render an inestimable service in promoting national defense.

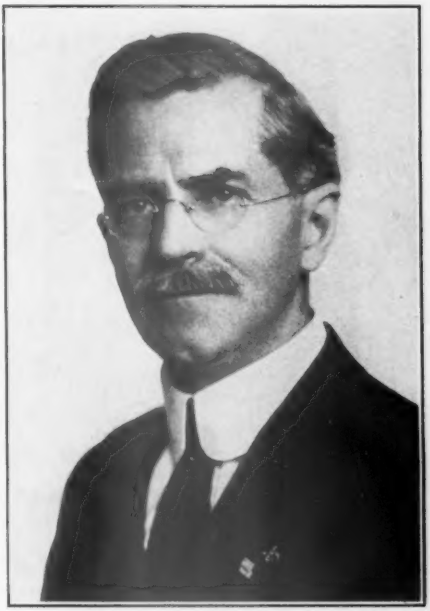
"It is by no means improbable that the existing industrial supremacy of the United States may be imperiled if we lose our relative lead in oil production, and therefore who can measure the importance of the service that has been rendered even in the past two years by the mining engineers of the country in pointing out the extent and character of the oil shale deposits of the United States. For it is in the direction of the retorting and distillation of the vast areas of shales of minable thickness and commercial richness that we must look to retain our lead in the production of the commercial petroleum products. The development of these shale areas ought to be one of the industrial responsibilities of the nation. In this work the mining engineer ought logically lead the advance."

The convention promises in its program to make the technical side of many important questions understandable to the layman. Thus, in addition to the moving pictures of the "core drill," there will be a great mass of interesting still and action pictures in connection with the various educational exhibits. Dr. Henry Mace Payne's lecture on the frozen gravels of Alaska and Siberia will have some marvelous films to supplement the discourse. Other moving pictures will show the effects of explosions in coal mines. There will be moving pictures of the big Mexican oil gusher, the Cerro Azul, of Mexico, to be shown and lectured upon by E. L. Doheny, of Los Angeles.

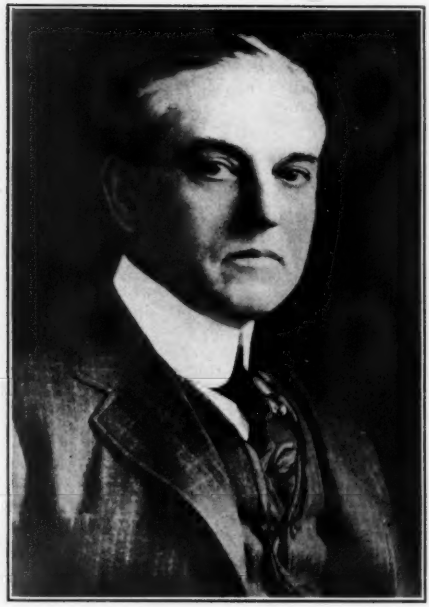
The address of Dr. Willis R. Whitney, who has been doing some wonderful research work for the General Electric Company, promises to be a feature of the convention. It is to be on the subject of the "Necessity for Research Work in the United States." It is to be a clarion call for national aid such as is given to the great research laboratories abroad.

On the general subject of "Safety," which is to be the feature of the morning session November 14, there will be several notable addresses. These will be followed by a discussion on the "Responsibilities and the Duties of the Operator, the Miner, and the Public."

For the general session Wednesday, when the subject will be "Efficiency in Mining Operations," there will be on hand a group of the country's greatest experts. Van H. Manning, Director of the U. S. Bureau of Mines, will speak on "Federal Aid in Mining Efficiency." The "Federal Trade Commission and the Mining Industry" will be discussed by Chairman E. N. Hurley, of the Federal Trade Commission-Charles M. Moderwell, a member of the executive committee of the American Mining Con-



J. F. CALLBREATH
Secretary, American Mining Congress



C. M. MODERWELL
Director, American Mining Congress

gress, will have an interesting report to present from the "Committee on Relations with the Federal Trade Commission."

For the general session Thursday, the subject will be "Conservation." On this day Dr. Whitney's address, which already has been mentioned, is expected to give occasion for a great deal of discussion.

President Carl Scholz, of the Mining Congress, will speak on "The Conservation of Property."

The section meetings, many of the topics for which were published in the October journal, promise much in the way of information that will be of great value to coal, oil, zinc, lead, copper, and precious metal mining men.

The address of Ralph Crews, of Chicago, on the subject "Cooperation in the Marketing of Coal" is to be followed by a discussion to which the secretaries of leading American Coal Marketing Associations have been invited. A sufficient number of acceptances assure a most thorough review of the entire subject. In fact, the interest in the matter is so great, that the time of the debate will probably be extended.

The address on "The Federal Petroleum Bureau," by H. G. James, of Kansas City, will be the occasion for a warm discussion in the oil section. Dr. J. C. McDowell's paper on "Geology in Its Relation to the Oil Industry," is one that will greatly interest men in the oil industry.

Frederick Laist's paper on "Electrolytic Separation," gives promise of some revelations of intense interest in the way of improved processes.

In the coal section, the paper to be read by H. T. Willard, of Cleveland, on "Cooperation," will drive home some great needs of the coal industry.

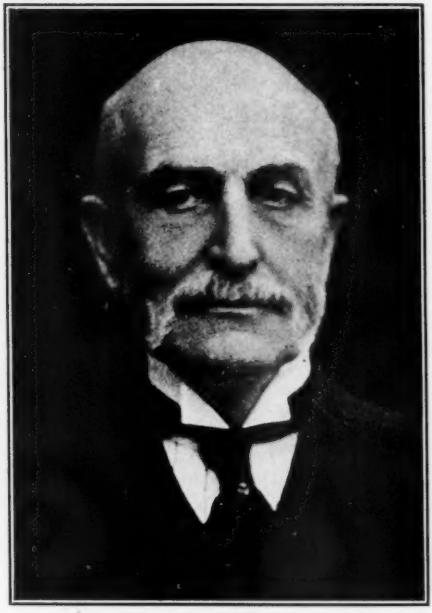
Dr. F. G. Cottrell's paper on "New Things in Science" is awaited with considerable interest, as he is the scientist who has had much to do with the progressive work done in the past two years by the U. S. Bureau of Mines in the improvement of metallurgical processes.

The assured success of the convention is due to a great extent to the splendid work of the local committee and the unstinting labors of the president of the Congress, Carl Scholz, of Chicago.

The details of local entertainments are now being prepared. The banquet will be in every way notable. Luncheons and one or two excursions to neighboring plants are also under consideration.

PROCEDURE CHANGED

For the first time in the history of its conventions the American Mining Congress has decided to devote the morning hours to the general meetings, and the afternoons to specific mining industries—metal mining, coal and oil. Each of these sections will have its own meeting room, and topics which are of interest to those in that particular industry will constitute the programs. Thus for the first time the sessions



M. S. KEMMERER
Director, American Mining Congress

CHARLES S. KEITH
Director, American Mining Congress

of the American Mining Congress will assume some of the aspects of distinctive industrial organization meetings. It is hoped that the attendance and discussions will warrant a continuance and an expansion of the idea of sectional meetings in connection with the regular conventions of the American Mining Congress.

PRESIDENT SELECTS NOTED MEN AS A. M. C. DELEGATES

The delegates appointed by President Wilson to represent the United States-at-large at the coming convention of the American Mining Congress comprise a group of highly trained and splendidly equipped men along practically every line of mining endeavor.

E. H. Benjamin, of Oakland, Cal., is a mining engineer, formerly general manager of the Joshua Hendy Iron Works of San Francisco. Formerly secretary and later president of the California Miners' Association. Member, American Institute of Mining Engineers.

H. M. Chance, of Philadelphia, Pa., is a mining engineer and geologist. Associate geologist of the Pennsylvania Geological Survey, geologist in charge of exploration of coal fields in North Carolina; manager of iron mines in Pennsylvania; assistant engineer in tunnel work; general consulting practice as mining engineer and geologist since 1887. Member, American Institute of Mining Engineers; American Philosophical Society; Engineers Club of Philadelphia. Mining and Metallurgical Society of America; Author of several geological reports and technical papers.

Curtis H. Lindley, San Francisco, Cal., is a lawyer, a member of firm of Lindley & Eickhoff. Honorable Professor, Department of Jurisprudence, University of California, since 1900. Member of California Academy of Science; associate member of American Institute of Mining Engineers; author, "American Law Relating to Mine and Mineral Lands, within the Public Land States." An authority on mining laws.

James MacNaughton, of Calumet, Mich., is a mine manager. Second vice-president and general manager of the Calumet and Hecla Mining Company, and general manager of all of its subsidiary companies. Member, American Institute of Mining Engineers; Institution of Mining and Metallurgy (London).

Van H. Manning, of Washington, D. C., is the Director of the U. S. Bureau of Mines.

E. P. Mathewson of Anaconda, Mont., is a metallurgist. Assayer, 1886–9, superintendent, 1889–97, Pueblo (Colo.) Smelting and Refining Co.; joined Guggenheim's Sons technical staff, 1897; was superintendent and manager at Perth Amboy, N. J., at Monterery, Mexico, and at Antofagasta, Chile, until 1902; in employ of Anaconda Copper Mining Co., 1902, first as superintendent of blast furnaces at Anaconda, then superintendent of entire plant; now manager

L. A. FRIEDMAN
Director, American Mining Congress

of Washoe Reduction Works of the company at Anaconda. Was manager, until January 1, 1913, of International Smelting and Refining Company's western plants. He erected the plants at International, Utah, and East Chicago, Ind. Member of the Montana State Game and Fish Commission; director, Hearst Free Library, Anaconda; member, American Institute of Mining Engineers; Institution of Mining and Metallurgy, London (gold medal, 1911); American Chemical Society; Society of Chemical Industry, London; contributor of technical articles on metallurgy to technical press and Transactions of Institute of Mining Engineers; inventor of various improvements in blast and reverberatory furnaces for smelting copper and lead ores.

Charles Piez, of Chicago, Ill., is president of the Link Belt Company, and is a member of the American Institute of Mining Engineers.

W. L. Saunders of New York City is an engineer; former president of the American Institute of Mining Engineers; a distinguished engineer and man of affairs, who has given much time to the invention and manufacture of rock-drilling machinery. Member of the American Society of Chemical Engineers; Society of Mechanical Engineers; National Civic Federation; New York Chamber of Commerce; president, Ingersoll-Sargent Drill Company, and chairman of the Board of Directors of the Ingersoll-Rand Company.

George Otis Smith is the director of the U. S. Geological Survey.

A. H. Woodward, of Woodward, Ala., is vice-president of the Woodward Iron Company, and a member of the American Institute of Mining Engineers.

EIGHT-HOUR DAY IN FORCE IN MOST OF SOFT-COAL MINES

In most of the bituminous coal mines of the United States the length of the working day is 8 hours. In 1915, out of a total of 5,076 mines for which the number of hours worked per day were reported, 3,018, or 59.5 per cent, worked 8 hours; 910, or 17.9 per cent worked 9 hours; and 1,148, or 22.6 per cent, worked 10 hours. The corresponding percentages in 1914 for 5,189 mines were 60, 17.5, and 22.5. The 8-hour mines employed in 1915 a total of 325,308 men; the 9-hour mines, 92,838 men; and the 10-hour mines, 127,268 men. In comparing the figures for 1914 and 1915 it will be noted that although there was a decrease in the total number of men employed, the number of mines and the men working 9 hours showed an increase, the States of Alabama, Kentucky, Ohio and West Virginia being noteworthy examples. Most of the same States show corresponding decreases in 8-hour and 10-hour operations. Other evidence points to the gradual shortening of length of working day, and the inference is that fewer 8-hour mines were operated rather than that any increased their length of working day.

It should be remembered, however, that when the length of the working day is stated, reference is made to the number of hours the mines are supposed to have been in operation, and not to the number of hours worked by the miners. In both the anthracite and the bituminous fields practically all the coal is mined by contract at an agreed rate per ton or other basis of payment. The miner is an independent contractor and is not obliged to put in a certain number of hours at his working place.

Since the settlement of the anthracite strike of 1912 and until the new agreement in 1916, the mines in that region have been operated on a 9-hour basis, with the exception of engineers and pumpmen, who work 8 hours, and of the miners, who work by contract.

SIGNIFICANCE SEEN IN CLOSE ORE ASSOCIATION WITH ANDESITE

Henry G. Ferguson, of the United States Geological Survey, discussing the Golden Arrow, Clifford and Ellendale districts of Nevada, says:

The three districts, although varying in the nature of their ore, show certain features in common. The deposits belong to the class of shallow vein deposits in which the mineralization followed closely the extrusion of lavas, or the welling up of intrusives that reached close to the surface. In each case the occurrence of the ores in close association with andesite is significant. It may be that one of the principal periods of Tertiary mineralization is to be associated with an epoch of andesitic volcanism. In the Manhattan and Tonopah districts there are masses of similar andesite, intrusive at Manhattan and occurring both as flows and intrusions at Tonopah, but in the Manhattan district the relations of the andesite and ore are not clear, and at Tonopah, according to Spurr, the ores of the different periods of vein formation are associated with rhyolite rather than with andesite.

At Clifford and Ellendale jarosite, a sulphate of iron and potassium, takes the place of part of the limonite as a result of the oxidation of pyrite. It is believed that the potash necessary to form this mineral has been obtained from the rhyolite.

BRITISH COLUMBIA COMPANY INSTALLING PUMPING PLANT

The British Columbia Copper Co. is installing a pumping plant to elevate the water from the Similkameen River to a distributing point 1,700 feet above the river, through a pipe line 6,000 feet long, according to reports to the Department of Commerce. The equipment will consist of triples pumps, and the pump line will be composed of 4-inch high-pressure hydraulic pipe in the lower station and steel pipe of 6-inch diameter at the discharge.

The water will be used to supply the mine, the camp, and a 50-ton experimental mill, which will be used for the working out of a concentration process preliminary to the erection of a 2,000-ton plant on the Similkameen River.

CONGRESS PROBABLY WILL PASS FINALLY ON LEASING BILLS AT NEXT SESSION

Success of Such Legislation Will Mean that Such a State as Colorado Will Have To Pay a Minimum Federal Tax of $250,000 on Its Coal Output—Question to be Discussed at Convention

Chicago, October 10.—"Had the present coal production of various western States been under a federal leasing system at the lowest rate of royalty which has ever been considered, such a State for instance as Colorado would now be paying upon its present coal production approximately a quarter of a million dollars annually to the federal government and the State would have been deprived of whatever taxes it now receives from its coal resources."

This statement is made by J. F. Callbreath, secretary of the American Mining Congress, who has just returned from a trip to the West in the interest of the nineteenth annual convention to be held at Chicago, November 13, 1916.

Elaborating this thought Mr. Callbreath went on to state that under a federal leasing system at the lowest rate of royalty which has ever been considered, Wyoming would be paying upon its present coal production approximately $125,000 annually. Washington $160,000, Utah $150,000, Montana $155,000, New Mexico $50,000 annually.

"The convention of the American Mining Congress," says Mr. Callbreath, "will afford an ideal opportunity for the West to present its claims to representatives from the eastern mining States whose congressional representation acting with western members can prevent unwise legislation and bring about the enactment of laws which will stimulate the development of western resources.

"Whether the Ferris Land Leasing bills shall be enacted or whether the amendments made by the Senate Committee shall prevail is of vital importance to the West. Whether the California Oil Claimants, whose rights are based on a compliance with the U. S. Land Office regulations then in force, shall be robbed of their property without right of appeal to the courts, as the Alaskan Coal Claimants have been, is of vital importance to every loyal citizen.

"Whether the resources of the West are to pay endless tribute to the National Government through a federal leasing system or whether these resources shall be subject to the taxing power of the States, concern directly every taxpayer. Whether a cumbersome agency two thousand miles away without knowledge of conditions shall control western development or whether the basic principle of republican government, home rule, shall prevail, and our development be controlled by those who know, is one of the most important and pressing questions now facing the West.

"The coming session of Congress at Washington will probably pass finally upon these questions. The leasing bills have passed the House of Representatives and are now before the Senate. Western Senators are entitled to great credit for the work thus far accomplished.

"The Senate is likely to approve the work of its committees, but unless the West shall rally to the support of the Senate Committee recommendations there is great danger that the House of Representatives may refuse its approval.

"Legislation along several lines of great importance to the West will be thoroughly discussed by those interested in the development of the western States, at the Mining Congress convention."

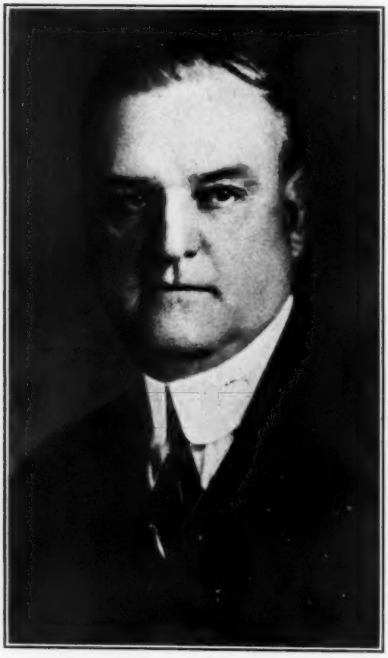
Discussing the various issues now pending before Congress, Mr. Callbreath said: "The next session of Congress will have under consideration the Foster Bill, for revision of mineral land laws of the West."

It will be recalled that a bill to investigate conditions at its public hearing in the western mining centers, making recommendations to Congress, was introduced by Senator Smoot, and passed the Senate, but failed to receive the approval of the House Committee on mines and mining.

In its stead Dr. Foster, chairman of the committee, introduced a bill intended to meet the requirements without the preliminary work of the Commission. This bill was severely criticized by the West and the mining journals. A thorough discussion of the subject will take place at the Chicago convention. Dr. Foster himself will lead the discussion and convey the plan he proposes. The discussion will be lively if the critics of his bill meet him on the floor.

SOME COALS CANNOT BE CLEANED BY HAND PICKING

Not all coal can be cleaned by hand picking. Some coal beds or parts of beds have layers or benches of slate and bone or contain more than the allowable quantity of sulphur in the form of iron pyrite so thoroughly mixed with the coal that crushing is necessary to free the coal from the refuse. For such coal washing is resorted to and, the coal being lighter than the refuse, is separated by currents of water. Coal is also cleaned in the dry state, and the product of one large company in Illinois is so treated, the results being included in the statistics of washed coal. A large part of the washed coal is slack used in the manufacture of coke, notably in Pennsylvania and West Virginia. This information was obtained by the Geological Survey.



VAN H. MANNING
Director, Bureau of Mines

THOROUGHNESS OF SURVEY'S RESOURCES DEMONSTRATED

Inquiry of the Geological Survey by one of the largest industrial corporations of the country regarding the possibility of obtaining a granite in this country similar to that found in a certain part of Europe developed an interesting case of the economic value of one of the Survey's scientific collections.

For a number of years the geologists of the Survey have been interested in securing additions to a reference collection of rocks from all parts of the world, the purpose being, however, a working collection for use in comparing rocks being studied in various parts of the United States. This collection now contains over 2,000 specimens, the great number of which have been analyzed by the chemists of this and other countries. It is by reason of this collection that the Director of the United States Geological Survey was able to reply at once that the Survey had samples of at least six granitic rocks from the localities mentioned with an analysis of each, which would enable the company's representative to get the information desired.

MUD-LADEN FLUID STOPS WASTE OF NATURAL GAS

"One of the most shameful wastes of this country's natural resources has been that of natural gas in the oil fields," says James O. Lewis and William F. McMurray, of the Bureau of Mines. "This waste has been occasioned very largely by not having efficient and cheap methods of controlling the gas, nor adequate laws and regulations to enforce the control.

"Soon after the establishment of the Bureau of Mines, investigations were started with the view of finding means of lessening this waste. In 1913 engineers of the Bureau of Mines were sent to Oklahoma to investigate the waste and to recommend methods for its prevention. These engineers recommended the mud-laden fluid system, which had been previously used in Texas and California, and demonstrated that the method was equally applicable to the conservation of gas in the mid-continent and eastern fields."

USE OF LIGNITE INCREASES IN NORTH DAKOTA INDUSTRIES

Practically all the lignite mined in North Dakota is used within the State, and nearly one-half is consumed at the place of production, not even being loaded on railroad cars. The increase in population is followed by greater use of coal, and although lignite, except in the remoter districts, is not largely used for domestic fuel, the industries, such as brick making, that do use lignite, are growing, and with their growth the production of lignite has increased steadily.

FAMOUS MARYLAND COALS ARE ABOUT WORKED OUT

Of the coal for which Maryland is famous, it is generally understood that the Elk Garden is entirely worked out and that the Big Vein George's Creek is fast approaching exhaustion according to the Geological Survey. When the extent of the lower but thinner beds is more fully realized and when labor can be obtained to mine these thinner beds at rates comparable with those in fields in adjacent States, the production of Maryland may be expected to increase again to the record output of about five and a half million tons of 1906 and 1907.

Orders Mill by Wire

The Talkeetna Mining Company of Seattle, Wash., is building a mill on their property near Knik, Alaska. They have ordered by wire from the Denver Quartz Mill & Crusher Company, for shipment at earliest moment, a Denver Quartz Mill and Feeder. This is the third shipment of Denver Quartz Mills that has gone into the Knik district in the past twelve months.

OIL INDUSTRY OF U. S. SAVED $50,000,000 BY AN APPROPRIATION OF $35,000

Hostility Which Marked Entrance of Bureau of Mines into Oil Fields Disappears When the Logic of Its Conservation Policy Becomes Evident—Ambitious Oil Program Being Carried Out by Bureau

By an expenditure of $35,000, the Bureau of Mines is in position to prove concretely that it has saved a minimum of $50,000,000 to the oil industry of the United States. There is reason to believe that the total saved as the result of the Bureau's work reaches a higher figure, and it is certain to continue increasing with the more extended application of the methods which it recommends.

The whole purpose of the petroleum work of the Bureau of Mines may be summed up in the statement "that it is working for the elimination of unnecessary waste and for the conservation of the country's petroleum resources." The Bureau is endeavoring to introduce the most efficient methods of drilling—methods that will not only conserve the natural gas, but that will protect the oil sands from premature flooding by water. The Bureau is ready to demonstrate any of the methods it recommends. It has practical engineers in its employ to perform these services.

When the Bureau entered the Oklahoma field three years ago, the method of drilling in vogue allowed a large percentage of the natural gas to waste to the atmosphere. The Bureau's engineers demonstrated, by actual drilling of wells, that by the use of the methods recommended by the Bureau it is practicable to drill oil or gas wells without wasting commercial quantities of gas. After three years' work, the value of the Bureau's methods are fully appreciated in Oklahoma, and has resulted in the universal adoption by the more progressive operators of this method, not only in the Oklahoma fields but in the Kansas field. In the latter case the operators were mostly from Oklahoma, however, and they adopted the method voluntarily. It is the object of the Bureau of Mines to extend this method to other States where it may be applicable. It is ready to cooperate with the producer in order to better drilling methods in any field. The Bureau's engineers have consulted and conferred with operators throughout the United States, giving them the benefit of their experience.

WOULD INCREASE OUTPUT

The Bureau is also carrying on an investigation with the view of increasing the recoverable percentage of oil from sands. By the present methods this recovery is less than 50 per cent. The Bureau's investigation will call attention to the possibility of increasing this percentage.

An investigation is also being conducted as to the best methods of protecting oil sands from infiltrating waters with the view of placing the information before the operators.

An investigation, also, is in progress on oil storage. This is being conducted with the view of preventing losses from evaporation and fire. The Bureau is calling attention to the unusually high aggregate of these losses. The comparative cost of different kinds of storage is also being furnished oil operators interested. The matter of protecting oil tanks from lightning is the object of special consideration just at this time. A report covering the findings of the Bureau, in this regard, is to be published in the near future.

Statistics are being compiled in the various fields showing the rate of decline and the ultimate production from these fields.

WOULD REDUCE COST

The drainage of oil sands and the spacing of wells is to come in for important consideration with the view of reducing the cost of drilling to a minimum.

Cracking of petroleum has called forth intensive investigation by the Bureau. The results of this work have been of great value to the oil industry. Without the Rittman process, it is believed the independent oil refineries, eventually, would be put out of business as the Rittman process is the only one which offers real competition to the Burton process, which is controlled by the Standard Oil Company. This work, also, it is expected will provide the means for the utilization, for motor purposes, of a large amount of petroleum which is not now used.

The Bureau is carrying on various research problems dealing with the chemistry of petroleum. It is cooperating with numerous refineries who are developing the Rittman process, and in addition to this, the Bureau is cooperating with the Navy Department and is to supervise the testing of the naval reserves.

COOPERATES WITH OTHER BUREAUS

In cooperation with the Bureau of Indian Affairs and with the General Land Office, the Bureau is looking after the development of oil on Indian and public lands.

An investigation which is attaining much greater importance is that pertaining to oil shales. This work will include, during the present year, the investigation of Scottish practices by the Bureau of Mines engineers. Statistics are being collected as to the refined products of

petroleum with the view of publishing this data annually, or oftener.

The total appropriated for the petroleum work for the Bureau of Mines is $70,000 this year. This is the total amount requested by the Bureau. Quite contrary to the experience of the Bureau of Mines and Geological Survey in other branches of mining, Congress has shown no disposition to be niggardly in its appropriations for oil investigation work.

The petroleum work of the Bureau of Mines is under the immediate direction of William A. Williams, the chief petroleum technologist. Much of the Bureau's success in this field is attributed to the tact and intelligence of Mr. Williams.

DISCRIMINATORY FREIGHT RATES ALLEGED BY OHIO OPERATORS

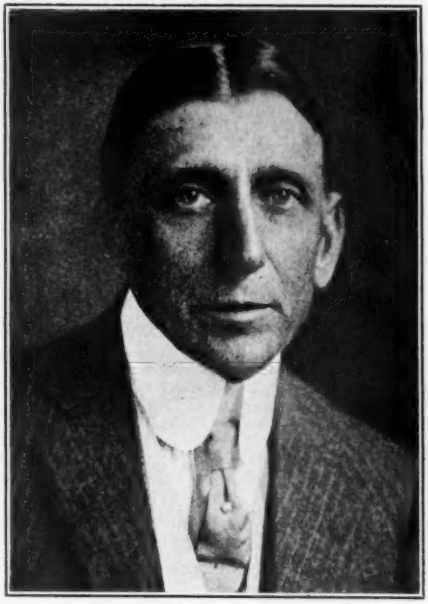
Ohio operators, especially those in the Hocking district, state that they are at a disadvantage, compared with West Virginia, because of unfavorable freight rates, comparatively higher mining rates, and the recognized superiority of the West Virginia coals for steam purposes. In the last few years Hocking coal has lost its position at the head of the Lakes as a steam coal to West Virginia and eastern Kentucky coals according to information given out at the Geological Survey. Railroads no longer give preference to Ohio coal and it is reported that the roads using this coal have reduced their consumption by perhaps 30 per cent through economies effected by the use of new mechanical devices for firing. Competition with outside fields for the markets within the State of Ohio is very keen, and Ohio operators are endeavoring to have the intrastate freight rates adjusted in such a manner as to enable them to control the major portions of this market.

PAN-AMERICAN PAPERS WILL BE READY APRIL 1

The Sixty-fourth Congress, First Session, appropriated in the Urgent Deficiency Bill $42,000 for the preparation and printing of the papers of the Second Pan American Scientific Congress. These papers will be printed in the language of the original.

The papers are being edited under the direction of Dr. Glen L. Swiggett, the Chairman of the Committee on Publication. The following members of the Executive Committee are associated with Dr. Swiggett in this work: W. H. Holmes of the Smithsonian Institution; Gen. W. H. Bixby, and George M. Rommel, of the Department of Agriculture.

It is expected that the proceedings will be printed and ready for distribution by April 1, 1917. The edition will be a limited one. Copies will be sent to the libraries of learned and scientific institutions and associations and to the leading universities of the twenty-one American Republics. Requests from individuals should be sent for file to Dr. Swiggett, 1423 New York Avenue, Washington, D. C.



WALTER DOUGLAS

Director, American Mining Congress

STEAM-SHOVEL MINING IS INCREASING IN COAL FIELDS

For the first time statistics have been collected by the United States Geological Survey to show the quantity of coal recovered from steam-shovel pits. The figures for 1914 were not complete and, although a comparison with 1915 can not be made, it is known that there was a large increase in this new branch of coal mining. The bituminous coal recovered from steam-shovel pits was only 0.6 per cent of the total, but in Indiana, Kansas, and Missouri the coal thus mined represents a notable part of the whole.

Mining conditions in the Pennsylvania anthracite region, where the beds are steeply inclined, faulted, and folded, are quite different from those in the greater part of the bituminous regions, where the beds are usually quite regular and approximately horizontal, and the methods pursued in recovering the coal are therefore quite different in the two areas. For the most part, anthracite is shot from the solid and the practice in that region does not appear to have met with the objections that have developed in the bituminous fields. Machine mining in the anthracite region has not been developed to any great entent, and less than 2 per cent of the total product is recovered in that manner. In fact, the quantity taken from steam-shovel pits is nearly as great as that mined by machines.

AMERICAN MINING CONGRESS, NINETEEN YEARS OLD, HAS HAD EVENTFUL CAREER

A Charter Member Gives Historical Account of Organization That Has Been Working to Unite and Direct the Energies of an Industry Struggling to Proceed along Most Intelligent and Effective Lines

By a Charter Member

The American Mining Congress was organized nineteen years ago, at the height of the agitation for free silver coinage. In Colorado, where mining men felt the great need of cooperation in matters pertaining to the industry which had just received its most serious setback, the idea was born. And strange to say its first rather indefinite purpose was to have a "Gold Mining Convention." Over in Gilpin County, where vast fortunes, both in silver and gold, had been taken out of the ground, there, at the home of the late Senator Henry M. Teller, the greatest of "silver" zealots, were men who believed that "gold was also an important factor in the economy of the world." In fact, all over the State there was this feeling of getting down to business on a "gold-mining basis".

And on July 7, 1897, the delegates assembled in Denver and elected former Gov. Alva Adams, as temporary chairman. The representation was excellent. When the inevitable free-coinage resolution had been debated, when all the rancor of the previous two years of free silver discussion had been fairly well boiled out of the convention, the delegates started in to do something tangible for the mining industry. It was termed the International Gold Mining Congress, and under this name it labored for five years.

At the very outset it gave itself the task of agitating for the creation of a Federal Department of Mines and Mining. The resolutions adopted had the right ring, but no concerted effort was made to put them into effect. The second meeting of the congress was held in Salt Lake City, former Gov. L. Bradford Prince, of New Mexico, presiding. The honor of the first actual presidency had been given him at the Denver convention.

The third convention of the Congress was held in Milwaukee in June, 1900, Col. B. F. Montgomery, of Cripple Creek, former lieutenant governor of Colorado, presiding.

In 1901, in the convention at Boise, Idaho, Gov. Prince was again chosen president. The fifth convention was held at Butte, Mont., and all of the movements which had received previous endorsement were again made a prominent feature of the proceedings.

These early years of the Congress comprised its formative epoch. The best mining men of the country, men who knew what was needed to rehabilitate the industry, took an interest in the affairs of the Congress. At the sixth annual convention which was held at Deadwood and Lead, S. D., Hon. J. H. Richards presided.

As a matter of fact the real history of the American Mining Congress, the period of effective labors, begins with the Portland convention, in 1904.

Now it was that the great mining engineers of the country began to take part in its deliberations. Government experts appeared at conventions with important papers. In 1904, for the first time, the president was persuaded to appoint delegates. Great men now proffered advice, and realized that only by such cooperation as the American Mining Congress furnished, could the mining industry be uplifted, and made a great power in the United States. Men like Charles W. Goodale, S. A. Taylor, James W. Malcolmson, Dr. James Douglas, D. W. Brunton, Hennen Jennings, Walter Reuter Ingalls, J. Parke Chaning, Edward B. Kirby, S. W. Mudd, John Hays Hammond, J. R. Finlay—to mention only a few of the many prominent engineers who are now among its most active members—took a hand in its deliberations. From this time on the resolutions passed by the Congress were accepted by legislatures and by both Houses at Washington as authoritative in the mining world.

Hon. J. H. Richards continued as president during the sessions at Portland, in 1904; at El Paso, Tex., in 1905; at Denver, in 1906; at Joplin, Mo., in 1907; and Pittsburgh, in 1908; and at Goldfield, in 1909.

In 1904, at the Portland convention, James F. Callbreath became secretary, and permanent headquarters were established at Denver. The American Mining Congress now became a tremendous factor in the development of the mining industry of the country—perhaps the greatest factor.

Out of the early propaganda for a Mining Department came the more practicable demand for a Bureau of Mines. Of this the late Dr. J. A. Holmes, who was its first director, said at the meeting following the establishment of the Bureau: "This movement for appropriate recognition and aid for the mining industry from the National Government has been under way for many years. Among its early and most active supporters have been the California Miners' Association and the American Mining Congress. It is, therefore, eminently appropriate that at the first session of the American Mining Congress, following the creation of the Bureau of Mines, at a session held in California, something should be said of the policy and purposes of the new Bureau." And in outlining these purposes Dr. Holmes expressed the thought that he

SECRETARY CALLBREATH AT HIS DESK IN THE WASHINGTON OFFICE.

would continue to lean heavily upon the American Mining Congress for the expression of what would be best for the mining industry in the future. It was at the sessions and from the men in charge of the work of the American Mining Congress that he hoped to get his inspiration for the labors which were so close to his heart.

But the history of the American Mining Congress can now best be told in the great utterances of its leaders, in the splendid committee work, in the resolutions passed, and in the determination to accomplish what had been resolved upon.

History is never a mere narrative of meetings and elections. It is, or rather should be, a chronicle of the spirit of cooperation by which men uplift themselves as well as their industry.

At the meeting of the American Mining Congress in Joplin, in 1907, Dr. J. A. Holmes, who, as has already been stated, later became the first head of the Bureau of Mines, made this epochal utterance: "We are going to ask this Mining Congress to march into the coal fields and capture the help of the mining interests in the central portion of the United States. Then with the concentrated effort on the part of the mining men from all sections of the country we may be prepared to obtain the cooperation and help from both the Federal and State Governments to which we claim the mining industry is entitled. We are today using up our mineral resources so rapidly that we are consuming both our own share and the share belonging to the future. We are dealing with great national problems as never before in the history of our mineral development; and we must consider and solve these problems in a true national spirit. In this connection the American Mining Congress must capture the East and the South as it has the West. Let us, therefore, hold our next two meetings, one in the heart of the Mississippi Valley coal fields, and another in the heart of the Alleghenies, probably at Pittsburgh. We will thus gain in Eastern membership and influence, and will become truly representative of the great American mining industries. We will then, the more easily, accomplish the great national purposes for which we have our being."

Impromptu as was the utterance, it was in a way climacteric. For true to his prediction, the next meeting was held at Pittsburgh, and the East opened its heart to the Congress. In fact within two years and by reason of the tremendous help given the original idea by the coal interests of the country, Congress passed the act creating the Bureau of Mines.

The successful battle on the flotation of worthless mining stock by unscrupulous promoters took definite shape at this meeting.

At this time, also, the objects of the American Mining Congress had crystallized into clear-cut issues, all of them of vast importance to the mining interests of the country. These had been carefully prepared by the officials, and President Richards, in reading them, said: "These summarize just what was presented to Secretary Garfield, and which seemed to him to justify us in our claim to the right to a Department. The American Mining Congress believes that the mining industry will be uplifted:

"1. By the granting of continued and larger

appropriations for the investigations by the Geological Survey, so that the results may be reached rapidly enough to more nearly meet the growing needs of the country, including:

"(*a*) The classification of the public lands;

"(*b*) The exploration, surveying and mapping of the geological formations, ore bodies, mineral deposits, etc.;

"(*c*) The investigations of the nature, extent and origin of these deposits and of the origin of the soils of the country.

"2. By the establishment at this time of a Bureau of Mines, with ample authority and funds for the investigation of, and inquiries into:

"(*a*) The methods and processes employed in the mining and quarrying industries and in the handling and treatment of mineral products with a view to aiding these industries, preventing mine and quarry accidents, and recommending appropriate legislation;

"(*b*) The wise utilization and conservation of our mineral resources through the prevention of waste, the development of more efficient methods, etc.;

"(*c*) The mining conditions; and the most efficient methods for the handling, treating and using of ores and other mineral products in foreign countries, with a view to benefitting American mining, quarrying and other mineral and metallurgical industries;

"(*d*) The publication, in such form as to be really available, of the information obtained from all these investigations and inquiries; the wide and prompt distribution of these publications among the mining men of the country; and cooperation of impartial Government experts in this educational work by public addresses in mining camps and at the meetings of men associated with mining and quarrying industries—with a view to the prevention of accidents, the preventing of waste, and more efficient work.

"3. The above action is recommended with a view to the establishment from time to time of other allied bureaus and ultimately the establishment of a Department of Mines if the conditions may warrant such action.

"4. By revising existing legislation relative to mineral lands and mining:

"(*a*) To provide for the separation of surface from under-ground ownership, with a view to the independent development of the mining and of the agricultural or forest industries;

"(*b*) To prevent fraud in the entry and patenting of mineral lands; and

"(*c*) To facilitate the disposition of these lands by lease, sale, or otherwise, under such conditions as will best facilitate legitimate and practical mining."

President Richards announced that when these were presented to Secretary of the Interior Garfield, he said: "I think you are entitled to a Bureau," and President Roosevelt promised a definite recommendation in his next annual report.

At the session of 1907, George Otis Smith, director of the United States Geological Survey, presented an important paper on "The Possibilities and Limitations of Geological Survey Work as Applied to the Mining Industry," and Edward Goodrich Acheson, the discoverer of a method for the manufacture of carborundum, discussed some of his remarkable experimental work in the production of crucibles from artificial graphites. At this session, too, the work of all the mining schools of the country was thoroughly gone into, and the first steps were taken to secure government aid for experimental work in mining States.

In 1908, the American Mining Congress invaded the East, holding a session in Pittsburgh from December 2 to 5. And here the inspired prediction of Dr. Holmes became an historical fact. For the coal men not alone participated in the proceedings, but joined their problems and their energies to what, while national in scope, had up to this time been a purely Western organization. At Pittsburgh the American Mining Congress, in its membership, and in its activities, put on the purple toga of nation-wide cooperation.

At the Pittsburgh convention the American Mining Congress definitely planned what up to this time had been but a tentative program for the most stringent possible "safety" legislation.

The fact brought out that, in 1907, 3,000 miners were killed in accidents, an increase of 50 per cent over the record of 1906, brought home to the convention the need of the most drastic action.

Congressman J. F. Burke, of Pennsylvania, and Congressman John C. Chaney, of Indiana, and Senator Charles Dick, of Ohio, took an active part in the proceedings at Pittsburgh, and were the sponsors for the measures which were later drafted into law, and which had been brought up and discussed at the meeting of the American Mining Congress at Pittsburgh.

It is appropriate at this point to add that the impetus given for the enactment of "Safety" measures at the Pittsburgh convention was far-reaching in its influence. Here is a record that speaks for itself.

Year	Production (short tons)	Employed	Killed	Rate per 1,000 empl.	Killed per million tons
1907	480,363,424	680,492	3,242	4.81	6.78
1908	415,842,698	690,438	2,445	3.60	5.97
1909	460,814,616	666,552	2,642	3.96	5.73
1910	501,596,378	725,030	2,821	3.89	5.62
1911	496,371,126	728,348	2,656	3.65	5.35
1912	534,466,580	722,662	2,419	3.35	4.53
1913	570,048,125	747,644	2,785	3.73	4.89
1914	513,525,477	763,185	2,454	3.22	4.78
1915 [1]	518,000,000 [1]	767,553 [2]	2,264	2.95	4.37

[1] (Estimated by U. S. Geological Survey.)
[2] (Subject to change.)

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Meantime, acting on the humanitarian impulse created by this movement, many large industrial and railroad organizations have created special "Safety First" movements, through which marvellous results are being obtained in the way of preventing accidents.

It is interesting in this connection to note that one of the sessions of the American Mining Congress was held at the Government Station for investigation of mine explosions, which on that day, December 3, 1908, was formally opened, Hon. James R. Garfield, Secretary of the Interior, delivering the dedicatory address.

The proceedings of the Congress at Pittsburgh commanded world-wide attention. Among the notable papers read were the following: "Relation of the Federal Government to Mining," by Senator Charles Dick, of Ohio; "Transportation of Mineral Products," by Edward H. Harriman; "The Importance of Arbitration as a Factor in the Advancement of the Mining Industry," by Carroll D. Wright; "The Federal Government in Its Relation to the Mining Industry," by Secretary of the Interior, James R. Garfield; "Problems of the Coal Mining Industry," by Dr. J. A. Holmes; "Conservation in the Coal Industry," by John Mitchell; "Arbitration as a Factor in the Mining Industry," by Judge George Gray, of Delaware, and Thomas H. Lewis, President of the United Mine Workers of America, and "Distribution of the Nation's Mineral Wealth," by George Otis Smith, Director of the U. S. Geological Survey.

The twelfth annual session of the American Mining Congress was held at Goldfield, from September 27 to October 2, 1909, Judge J. H. Richards presiding. At this meeting Secretary Callbreath announced the first great advance in the movement to establish a Bureau of Mines: "During the Sixtieth Congress," he reported, "a bill was introduced in the Lower House for the creation of a Bureau of Mines, and passed by that body by a vote of 229 to 21. The bill was approved by the Senate Committee, but was talked to death in the final hours of the session. We will have to begin our work all over again."

And the Congress went on record again with a determination to win out at the next session.

Among the notable addresses at the Goldfield gathering, were the following: "National Problems," by Hon. Francis G. Newlands, of Nevada; "Silver and the National Government," by Judge C. C. Goodwin, of Salt Lake City; "Inspection of Mines," by Dr. J. A. Holmes; "The Mining Man's Interest in Land Classification," by George Otis Smith.

Dr. E. R. Buckley, of Rolla, Mo., head of the Missouri School of Mines, took the presidency at the thirteenth annual session which was held at Los Angeles from September 26 to October 1, 1910. And at this Congress, Dr. J. A. Holmes delivered his first public address as head of the newly created Bureau of Mines.

But the creation of the Bureau of Mines was a task that had its ramifications, and the Congress at Los Angeles lost no time in formulating by resolution much of the work it expected the new bureau to accomplish.

This covered a wide latitude from effective "Safety" measures for both coal and metal mines to a most comprehensive exploitation of

the underground resources of the United States. It meant, moreover, that the Congress must put its shoulder to the wheel and urge the largest possible appropriation for effective work.

It was at this session of the Congress that the movement for a thorough revision of the mining laws of the country, was given a decided step forward.

But the most important report submitted was that of the Committee on Prevention of Mine Accidents. Its recommendations became of international interest and have since been incorporated into the statutes of many of the mining States of the country. The committee consisted of Walter R. Ingalls, chairman, J. Parke Channing, James Douglas, James R. Findlay and John Hays Hammond. It was first appointed by the American Mining Congress in 1906, reported progress in 1907 and 1908, and in 1909 was given permission to submit its report to the American Institute of Mining Engineers and to the Mining and Metallurgical Society of America as well as to the American Mining Congress.

This committee collated the mining laws of all the States and of foreign countries, and from a study of these compiled the now famous model statute "Relating to metalliferous mines and to provide for the health and safety of persons employed in and about the same." It gathered all available statistics on fatal mine accidents, and clearly established what had, up to this time, been only suspected, namely, that the loss of life in metal mining in the United States is fully as great as in coal mining. One of its most important recommendations, and which resulted in greater State appropriations through the West, was the concluding paragraph in its report on mine inspection.

"In the opinion of the committee, the essential steps toward reducing the loss of life in metalliferous mining are, "(1) a comprehensive and effective law; and (2) an adequate system of mine inspection. The latter is the keystone of progress. Much can be accomplished by an adequate system of mine inspection, even if a comprehensive law be lacking, but no matter how thorough and effective in theory a law may be, it will fail in its purpose unless provision be made for its sincere, impartial and positive enforcement by an adequate system of competent mine inspection.

"To secure such a system of mine inspection, the States must appropriate a good deal more money than any has yet done. Each State must have a mine inspector, and he must be provided with a sufficient number of deputies to enable frequent inspections of all operating mines to be made. One inspection of a mine in a year is not enough. The inspector and deputies must, moreover, be provided with proper funds for clerical work, traveling expenses, etc. So far as we are aware, the State of Colorado makes the largest appropriation for inspection of metal mines, its appropriation being $25,000 per year. Other important mining States appropriate only $10,000 per year. In the opinion of the committee, such appropriations are utterly inadequate. For States possessing a mining industry of the importance of that in Colorado, Utah, Montana, Nevada, California, and, in fact, all of the States and Territories west of the Rocky Mountains, an annual appropriation of $50,000 to $100,000 per State is necessary. Such expenditures are thoroughly justified by the importance of the end to be gained."

At this session of the Congress another important report was that of the Committee on "Standardization of Electrical Equipment in Coal Mines." The proposed code of rules presented at this time, and as revised at the following sessions, have since been incorporated in the statutes of many of the States of the Union.

Among the notable addresses at this session were the following: "The Bureau of Mines and Its Work," by Dr. J. A Holmes; "Proposed Legislation for the Disposition of the Public Lands," by Hon. Richard A. Ballinger; "Shall We Have Private Ownership or a Leasing System," by Hon. F. W. Mondell; "Conservation as It Affects the Oil Industry," by Hon. Gifford Pinchot.

The fourteenth annual session was held in Chicago, from October 24 to October 28, 1911, Hon. John Dern, of Salt Lake City, presiding. The event of greatest import was the presence at this session of Hon. William H. Taft, President of the United States, who spoke on the topic, "The Government and the Mining Industry." M. Jean de Pulligny, director of the French Mission of Engineers to the United States, was another notable guest whose address to the convention covered conditions of mining abroad. England and Canada also had prominent representatives in attendance who participated in the discussions.

The subject of workmen's compensation laws was ably discussed, the report of the committee on that topic furnishing the basis for most important legislation.

At this session steps were taken to establish headquarters in Washington, and the by-laws were amended to permit of an extension of the work by admitting to membership coal mining organizations or kindred bodies. These changes have been of great import in the history of the American Mining Congress. By establishing its headquarters in Washington, the Congress was able to keep in close touch with Federal legislation on all mining subjects; to suggest measures approved by the conventions and to oppose whatever might be deemed injurious to the industry.

Among the notable addresses at this convention in addition to those already mentioned were the following: "The Public Land Question," by Gov. William Spry, of Utah; "The Past, Present and Future of Copper," by Horace J. Stevens, of Houghton, Mich.; "The Economies of the Coal Industry," by Carl Scholz, of Chicago; "What the West Needs in Coal Land Legislation," by Dr. George Otis Smith, of Washington, "Alaskan Problems," by Hon. Walter L. Fisher, Secretary of the Interior, and "The Relation of Congress to the Mining Industry," by Dr. Martin D. Foster, Chairman

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of the House Committee on Mines and Mining.

The fifteenth annual convention of the American Mining Congress was held at Spokane, Wash., from November 25 to 29, 1912, Samuel A. Taylor, of Pittsburgh, presiding.

The detailed report of the Committee on Standardization of Electrical Equipment in Metal Mines was submitted at this session, and is today considered an authoritative document in the compilation of legislation on this subject.

Among the notable addresses at this session of the American Mining Congress were the following: "The National Forests and Development of Natural Resources," by Henry S. Graves, United States Forester; "The Washington Compensation Act," by John H. Wallace, of Olympia, Wash., and "The Leasing of Mineral Lands," by William Griffith, of Scranton, Pa.

In 1913, the American Mining Congress held its sixteenth annual session at Philadelphia from October 20 to 24, David W. Brunton, of Colorado, presiding. The question of a revision of the mining laws of the country which had been agitated during successive Congresses, was now taking more definite shape. The cooperation of the American Institute of Mining Engineers, and of the Mining Metallurgical Society of America, was announced, and it was hoped that the three bodies acting together would obtain the long sought for legislative reforms in Congress.

Among the notable addresses at the Philadelphia convention were the following: "Relation of Big Business to Industrial Prosperity, with Special Reference to Mining," by Dr. Charles A. Van Hise, President of the University of Wisconsin; "Conservation from the Western Standpoint," by Senator John F. Shafroth, of Colorado; "Needed Changes in Our Mineral Land Laws," by Senator Thomas J. Walsh, of Montana; "Arbitration as a Factor in the Mining Industry," by Wm. B. Wilson, Secretary of Labor; "The Public Land Laws," by Assistant Secretary of the Interior, A. A. Jones; "Our Radium Resources," by Charles L. Parsons, Chief of the Division of Mineral Technology, Bureau of Mines; "The Federal Government and the Mining Industry," by Hon. M. D. Foster, Chairman of the House Committee of Mines and Mining, "Lessons of the Year in our Mining Industry," by Dr. Joseph A. Holmes, Director of the U. S. Bureau of Mines.

The seventeenth annual session, at Phoenix, Ariz., held from December 7 to 11, was presided over by Carl Scholz, of Chicago, and was marked by the last appearance at its session of the late Dr. Joseph A. Holmes, Director of the U. S. Bureau of Mines.

His remarks, brief as they were, had all the brilliancy of the past. He had traveled a long distance to be at these sessions which, to his far-seeing mind, formed the basis for all the success achieved in the establishment of the Bureau of Mines, and for whatever it could do in the future. Here, he felt, he was in touch with the mining men of the country, the working and the operating classes, the men who knew what was best for the industry. And so he came to speak when he was physically too weak to make such an effort. He had a message to deliver, but could not complete it, and, only when a friendly point of order was raised, did

he consent to take his seat. But these last remarks before the American Mining Congress contain a message of work, of duty yet to be performed. "Since the Bureau of Mines was organized," said he, "there has been comparatively little increase in the moneys appropriated for the actual investigations of mining, consequently we have not been able to do the amount of work which we would like to have done. Our plans for the present year are in no way enlarged upon those of the past year. Now, that is a condition which is going to continue as it is now until the mining people of this country make up their minds to the fact that they are not being treated on the square. You realize this very interesting information brought out by the President in his address the other evening that, whereas every miner in this country contributes something like $1,800 a year to the national wealth, as compared to $800 or $900 contributed by every farmer of the country to the national wealth, at the same time the people of the United States contribute 28 to 30 cents per capita for the advancement of agriculture and less than 2 cents per capita to the advancement of mining; that in spite of the fact that mining is the most hazardous of our great industries, and agriculture is the safest; that in mining we have one lot of mineral resources and that when they are gone, the nation must depend upon something else or some other country, whereas agriculture is a self-perpetuating industry. Why is it, that it is so difficult to get anything done out of the Federal or State Treasury on behalf of mining? And the first reason which I found in talking with members of Congress is the fact that when you talk to them about helping mining, what they see is the Homestake and the Treadwell and the United Verde and half a dozen great, big mines in the country, and they say, 'Why, those fellows are rich enough to take care of themselves.' They don't see the small mines of the country; they don't see the struggling miners who are trying to build up a great industry, and the reason they don't see these things is because they are not presented to them; and in that connection I want to emphasize one of the most important lessons for this session of the Mining Congress to learn thoroughly, and that is that until the mining people of this country do what the railroad companies of the country are doing, educating public sentiment as to what the great industry is and what it means to this nation, the people of the United States will never understand it."

The letter from Hon. Woodrow Wilson, President of the United States, was in a way a keynote for the work of the Congress:

"It will always be a tribute to your foresight and energy," he wrote, "that this new Bureau of Mines in the short period of its existence, with the kindly cooperation of State and other agencies, has been able, by persistent and intelligent effort, to turn an isolated, local movement for greater safety into a great national movement for 'Safety First' that has already gone beyond the mining industry into every industry of the country. I venture to say that thousands of lives have been saved by that movement and that many thousands more will be saved in the future.

OFFICE IN WHICH THE STENOGRAPHICAL AND GENERAL CLERICAL WORK IS DONE

"Gratifying as the results of this life-saving campaign may have been, however, there is still vigorous work for your Congress to do. I am informed that during the last year, more than 3,000 men were killed and 100,000 injured in the mining and metallurgical industries of the country. . . . I suggest this situation as an opportunity for further endeavor on your part to cut down this excessive toll of death and injury."

At this session a decided advance was made in formulating the views of the country on mine taxation and on mine law revision and putting both these topics into statutory shape.

The first steps were also taken to establish, as an adjunct to the American Mining Congress, a Bureau of Mining Economics, which is to gather information covering every phase of practical mining, which is to keep in touch with markets, with production, with legal decisions, etc., etc. This movement is still under serious consideration and is making good headway.

At this convention it was determined to begin the publication of the MIN'NG CONGRESS JOURNAL, the first issue of which appeared in January, 1915.

The eighteenth annual convention was held in San Francisco, from September 20 to 22, President Carl Scholz, presiding. The notable event of the gathering was the Holmes Memorial Service, at which a vast host of admirers and friends paid tributes to the work and character of the late Director of the U. S. Bureau of Mines. All of the great problems which had come before the American Mining Congress in past sessions and still needed settlement were carefully discussed and prepared for presentation to State and national legislative bodies. Among the notable addresses at this convention was that by the successor of Dr. Holmes as Director of the Bureau of Mines, Hon. Van H. Manning. His presentation of "What the Bureau of Mines, in the Department of the Interior, Is Doing and Hopes to Do for the Metalliferous Mining Industry," was masterful and comprehensive.

Other notable addresses at this session were the following: "Plain Writing," by Dr. George Otis Smith; "Prejudice against Regulation," by Rush C. Butler; "California's Water Infiltration Law," by Fletcher Hamilton; "Federal Control of Water Power," by Hon. J. H. Richards; "The Need of Better Mining Education," by Charles F. Willis; "The Development of Mine Taxation in Arizona," by G. H. Dowell; "Workmen's Compensation Insurance and the Coal Mining Industry," by Herbert M. Wilson; "The New Plan of Mining Insurance," by David Ross; "Mining Hazards on the Pacific Coast," by Dr. Frederick L. Hoffman, and "Future of the American Zinc Industry," by Otto Ruhl.

This history of the American Mining Congress is compiled largely from the records of the conventions held from year to year, and to a great extent, and necessarily, bridges over an immense amount of labor done by officials and committees between sessions. But it would not be a history in any sense if it did not include as far as this is possible, some mention of what one must call the more intimate work of the Congress.

When James F. Callbreath was elected

ENTRANCE TO THE AMERICAN MINING CONGRESS' SUITE OF OFFICES.

secretary, in 1904, at the Portland convention, the Congress felt that its influence must not begin and end with annual discussions and resolutions. Here were the expressions, the sentiments, here was the consensus of opinion of the mining men of the country. It was imperative that these recommendations should be shaped into laws, both State and national, and to Mr. Callbreath, as secretary, was given the task of driving home, so to speak, the determinations of the Congress. How well the task was done, how brilliantly and conscientiously the purposes of the Mining Congress were brought to the attention of the law makers of the land, is best attested by the results. The task was, in many respects, herculean, for there were vast interests opposing every progressive movement of the Congress. And it was sheer grit, and a gripping persistence on the part of the officials of the Congress and the men who worked with them in the intervals between conventions that wrested from legislators, State and national, important reforms that have bettered the working conditions in the mines, have saved the lives of thousands of workmen, changes that have made mining investment safe and stable, new laws that have uplifted the mining industry of the country.

And the work of preparing for the conventions, of mapping out programs, of securing speakers of note, of interesting a greater number of mining men in the cooperative work of the Congress, all the vast details of preliminary work, has been done by Mr. Callbreath with rare zeal and intelligence, and is reflected in a constantly growing organization and in more and more interesting and instructive conventions.

In 1913, Carl Scholz, of Chicago, was elected President of the American Mining Congress. He was re-elected at both the following conventions, and without reflecting on the many capable executives of the past, it is but just to him to say, that no one has had the welfare of the Congress more at heart, no one has ever served it with a greater zeal for the advance of the mining interests in America. No task in behalf of the industry proved too arduous for him to undertake, and no executive has ever carried out with greater skill and with more success the determinations of the Congress.

OFFICES ARE REPRESENTATIVE

American Mining Congress Housed in a Manner Compatible with the Dignity of a Great National Industry.

Offices in Washington are maintained by the American Mining Congress on a scale compatible with the dignity of an organization representing the great mining industry of the nation. These offices are in the new Munsey Building, which is one of the beautiful edifices gracing the busiest section of Pennsylvania Avenue.

The American Mining Congress occupies offices Nos. 743, 744, 745 and 746. These offices are en suite, and are in that portion of the edifice adjoining the Geological Survey Building.

Accompanying this article are cuts showing the interior views of the five spacious rooms occupied by the Mining Congress.

When any one interested in mining is in Washington he is invited to make the Mining Congress offices his headquarters.

ARIZONA BEGAN PRODUCING COPPER STEADILY IN 1875

The steady output of copper from Arizona began in 1875. There was an intermittent production, however, prior to that date. A record of production exists as early as 1862, says B. S. Butler, of the U. S. Geological Survey.

Since 1880 the growth of the copper mining industry in Arizona has been steady and rapid. At the close of 1915 Arizona had recorded a production of 5,072,851,628 pounds of copper or 24 per cent of the total output of the country. It ranks third among the States in total production.

WASHINGTON COAL MARKETS BEING SUPPLIED FROM CANADA

The removal of the duty on coal has allowed increasing quantities of Canadian coal to enter the Washington markets, coal from Vancouver Island now being used extensively in the Puget Sound cities and British Columbian coal from the Crow's Nest district entering the Spokane district according to the U. S. Geological Survey. The bunker trade has fallen off since the war began, and the number of vessels entering the Sound ports has decreased. This is offset to some extent by vessels having westbound cargoes above normal now taking on fuel coal in Washington (or Vancouver, British Columbia) ports rather than carrying sufficient Japanese coal for the round trip. A material betterment in the lumber market, the principal industry of the Northwest, will, of course, benefit the coal producers.

SHOOTING FROM THE SOLID FORBIDDEN IN SOME STATES

Opposition to shooting from the solid has developed, because it is injurious to the mining property in that the unusual charges of powder weaken the roof and pillars, which increases the liability to falls of roof and coal, the most prolific cause of fatal accidents to coal miners. Another objection to this method is that the heavy charges of powder required to blow down the coal where it has not been previously undercut or sheared, result in the production of a much higher proportion of fine coal and render the lump coal so friable that it disintegrates in handling and in transportation. With the growing use of mechanical stokers and of powdered coal, the latter objection is losing much of its force, but the danger attending the method has been in no wise diminished, and it is forbidden by law in some of the coal-mining States.

EDW. N. HURLEY

Chairman, Federal Trade Commission, who will speak on "The Federal Trade Commission and the Mining Industry."

NUMEROUS SMELTING PLANTS ARE TREATING COPPER

Smelting plants which treated copper in the United States during 1915 are as follows: Arizona Copper Co., Clifton, Ariz.; Shannon Copper Co., Clifton, Ariz.; Calumet & Arizona Mining Co., Douglas, Ariz.; Copper Queen Consolidated Mining Co., Douglas, Ariz.; Old Dominion Copper Mining & Smelting Co., Globe, Ariz.; American Smelting & Refining Co., Hayden, Ariz.; Consolidated Arizona Smelting Co., Humboldt, Ariz.; United Verde Copper Co., Jerome, Ariz.; International Smelting & Refining Co., Miami, Ariz.; Detroit Copper Mining Co., Morenci, Ariz.; Penn Mining Co., Campo Seco, Cal.; Mammoth Copper Mining Co., Kennett, Cal.; Mountain Copper Co., Martinez, Cal.; Wanakah Mining Co., Ouray, Colo.; Ohio & Colorado Smelting & Refining Co., Salida, Colo.; Baltimore Copper Smelting & Rolling Co., Baltimore, Md.; Lake Superior Smelting Co., Hancock, Mich.; Quincy Mining Co., Hancock, Mich.; Michigan Smelting Co., Houghton, Mich.; Calumet & Hecla Mining Co., Hubbell, Mich.; Missouri Copper Mountain Mining Co., Sullivan, Mo.; Anaconda Copper Mining Co., Anaconda, Mont.; East Butte Copper Mining Co., Butte, Mont.; Anaconda Copper Mining Co., Great Falls, Mont.; American Smelting & Refining Co., Omaha, Nebr.; Nevada Consolidated Copper Co., McGill, Nev.; United States Metals Refining Co., Chrome N. J.; American Smelting & Refining Co., Maurer, N. J.; Balbach Smelting & Refining Co., Newark, N. J.; Raritan Copper Works, Perth Amboy, N. J.; Santa Fe Gold & Copper Mining Co., San Pedro, N. Mex.; Nichols Copper Co., Laurel Hill, N. Y.; Tennessee Copper Co., Copperhill, Tenn.; Ducktown Sulphur, Copper & Iron Co. (Ltd.), Isabella, Tenn.; American Smelting & Refining Co., El Paso, Tex.; Garfield Smelting Co., Garfield, Utah; International Smelting & Refining Co., International, Utah; Norfolk Smelting Co., West Norfolk, Va.; Tacoma Smelting Co., Tacoma, Wash.

ANTHRACITE COAL USED IN COMPARATIVELY LIMITED AREA

"Anthracite is shipped to nearly every State in the Union and to many foreign countries. The major portion is consumed in the territory near Pennsylvania, including Canada. In the larger eastern cities its use has become a necessity, but farther west and south anthracite is more of a luxury than a necessity, and in the States most remote from the East the quantity consumed is small," says C. E. Lesher, of the Geological Survey.

"The output of the anthracite mines is carefully crushed, cleaned, and divided into sizes by a process and at a cost that render it little less than a manufactured product. There are ten of these sizes, each with its price and special use. Two major divisions are recognized, however—the prepared or domestic sizes, including broken, egg, stove, and chestnut, which range from 4 inches down to three-fourths of an inch, and the steam coal, including pea, buckwheat, buckwheat No. 2 (rice), and buckwheat No. 3 (barley), which range from three-fourths to one-sixteenth of an inch. The domestic sizes are in greatest demand and consequently bring the highest prices. Attention in preparation is therefore directed to obtaining the largest possible proportion of those sizes, and the finer coal resulting from the crushing is a by-product. It is not possible, however, to increase the proportion of domestic sizes beyond 60 to 65 per cent of the coal shipped, or 50 to 55 per cent of the total product."

CLEMENTS IN TEMPORARY CHARGE OF MINING TECHNOLOGY

Dr. J. K. Clements has taken charge of the division of mineral technology at the Bureau of Mines during the absence of Dr. Chas. L. Parsons. In order to take over this work it was necessary for Director Manning to secure a furlough for Dr. Clements from the Pennsylvania National Guard. Dr. Clements is a major in this organization and has been doing duty on the border.

SYSTEM REPLACES CHAOS AT MINE DISASTERS UNDER BUREAU OF MINES PLAN

Inexpensive Organization among Employes of Mine Provides for All Contingencies That May Arise in Case of Accident—Plan Discussed in Bulletin Now Being Distributed

The manner in which the Bureau of Mines is turning chaos into systematic rescue work is shown in the publication of "Rescue and Recovery Operations in Mines after Fires and Explosions." The authors of this bulletin are James W. Paul and H. M. Wolflin. An unusually large number of this bulletin will be distributed.

Following disasters in mines the history of such catastrophes is that much confusion and lack of systematic efforts at rescue work result. Essential equipment often is lacking. At times foremen are cut off in the mine and no one is at hand to take charge of the rescue operations. This bulletin urges systematic preparation for possible accidents. It is published in the new pocket size, which form is to be adopted in the publication of a number of Bureau publications, which it is desired to have conveniently in hand in case of accidents.

Van H. Manning, Director of the Bureau, in his preface to this bulletin says:

In the course of the work being done by the Bureau of Mines to increase health, safety and efficiency in the mineral industries there is need of close and intimate association and cooperation with other agenies working for the same end. The bureau gladly acknowledges the work done by the States, by technical societies and local institutions, chambers of commerce, miners' organizations, opertors and many other agencies, and seeks to make use of their results in planning its own investigations.

The Federal Constitution recognizes certain functions of the States which are commonly known as State rights. The Bureau of Mines does not attempt to usurp any of these functions, but seeks to cooperate with the States in investigations that will benefit a State and the Federal Government. Because the Government through its greater resources is able to carry on more extensive and longer investigations, it is generally better able to command the services of specially trained men, and the State receives a benefit through cooperation that it could not obtain otherwise.

Without the aid of the operator who has developed the mines, the bureau could accomplish little in an effort to be of service to the mining industry. Aided by the kindly cooperative spirit of mine owners and operators, the bureau can prosecute its work. Investigations conducted within mines by the engineers of the bureau have a scientific and practical value that in time will innure to the benefit of both operators and miners, as well as to State mine inspectors.

At times of explosions and other disasters the engineers of the bureau come in intimate contact with the inspectors, who, in all instances, have extended the courtesies of their State.

On many occasions when rescue men of the Bureau of Mines have reached mines in which miners have been imprisoned by explosions or fires, the inspectors have availed themselves of the services of the trained men by consulting as to methods of procedure and the advisability of permitting explorations in advance of the fresh air by crews wearing breathing apparatus. In a number of instances the inspector himself has donned apparatus and directed the rescue crews.

In the work of the bureau's rescue crews full cooperation with the inspector or inspectors is of prime importance, as in most instances the management of the mine turns over to the inspector the direction of the work incident to rescuing entombed men and to recovering the dead and injured.

THE MINER

So much is dependent on the miner, whose work and acts control his own safety, that the bureau has taken every opportunity to cooperate with him and to receive his assistance and advice. Miners have been especially unselfish and helpful, not only to the bureau, but to the mine owner, in assisting in mine recovery and rescue operations; they have gladly volunteered to receive training in the modern methods of rescue and first-aid work, and now compose the growing army of trained men ready to offer aid at time of need.

A large part of the work of the bureau deals purely with investigations of the causes and the prevention of accidents, and seeks to increase safety and health in the mining industry. Investigations are conducted in a mine after an explosion or fire in order to obtain information of scientific value for conducting experiments that will show the cause of the explosion, fire or other accident, and will develop methods of prevention.

The Bureau of Mines, with much care and at much expense, has collected information in the United States and in Europe on mining methods and the prevention of accidents. Having thus a store of knowledge on many

subjects of vital importance to the mining industry and to the safety of the mine workers, as well as the knowledge gained through experiments in laboratories and mines, the bureau endeavors to impart the information to the miner, the operator and all others concerned in mining. For this reason the bureau is conducting an educational campaign in all the mining centers of the country by means of public lectures illustrated with lantern slides and moving pictures, by teaching first aid to the injured, by training miners in the use of rescue breathing apparatus, and by lectures on rescue and recovery methods. All of this instruction is furnished without cost to the miner.

POLICE POWER

The Bureau of Mines has no authority of law to enter any private mine or to require any operator or miner to observe any law or regulation. As the mines are the property of the mine owners, members of the bureau gain admittance to any mine only through the invitation or the permission of the owner or the officials of a mine. Through this freedom of entry extended by the operators the bureau has obtained much valuable scientific information. This information has been carefully guarded to prevent its being used in such a way as would antagonize mine owners and lead to free entry to their mines being denied the bureau's engineers. The bureau's adherence to this practice, in compliance with regulations of the Interior Department, has been the occasion of some misunderstanding when engineers of the bureau have been subpœnaed to testify before coroners' juries, who under State laws are required to place the blame for criminal acts or for negligence.

The bureau has no authority to enforce any of its recommendations, still less to enforce any provision of State laws. At the best, it can only recommend and leave the operator and the miner free to adopt or to reject. The recommendations of the bureau to the general mining public are printed in the publications issued by the bureau. After an investigation of a mine disaster a report is prepared for the benefit of those engineers of the bureau who are engaged in studying methods of accident prevention. The report contains the conclusions and recommendations of the engineer who conducted the investigation in the mine. At the request of the operator a copy of the report is furnished for his confidential information. As a rule, the operator has endeavored to adopt the recommendations in the subsequent operation of the mine.

The Bureau of Mines intends to publish, from time to time, combined reports in which, without the mines being named, the results of inquiries regarding causes and effects of different features of disasters will be stated for the benefit of students of mine methods, and primarily to point out ways in which disasters may be prevented.

POLICY IN COOPERATIVE WORK

The bureau aims to extend its educational work, to train a large number of miners in the use of rescue breathing apparatus, to induce operators to establish rescue stations provided with breathing apparatus, and to keep crews of men trained to use the apparatus immediately when life may be saved. When a disaster imprisons miners, the nearest trained rescue men and rescue car or truck of the bureau is dispatched to render all possible assistance to those in charge of the rescue and recovery operations. The bureau's men have no authority to assume charge of ary of the work, and do so only at the request of the mine officials. On arrival at the mine, the bureau's men confer with the official in charge and the State Mine Inspector, and tender any assistance that may be of use in rescuing imprisoned men. In the conduct of rescue operations the bureau's men exercise their best judgment in the part they may take; they observe the regulations for their own safety and the safety of others who may be working under their direction.

To facilitate the work of rescue and recovery the officials of the mine should summon twenty or more trained rescue men to work in cooperation with the bureau's men, as rescue operations require thorough organization. To be effective, the crews must work systematically and keep in good physical condition, observing the rules for periods of work and rest. Thus, if the rescue work is to be continued, the need of having on hand at least twenty trained men is evident.

The Bureau of Mines maintains only one trained rescue man at each of its several stations, and not over three on any one of its cars, and such a small force can not conduct rescue or recovery work without assistance. The Bureau is not able financially to keep in its employ at each station and on each car enough trained men to make a properly constituted rescue crew, therefore in order to accomplish rescue work the services of trained miners must be obtained. To procure this additional assistance involves expenditure for transportation, subsistence and wages during the time the miners are absent from their regular work, and this expenditure the operator of the mine in which an explosion or fire occurs is expected to meet. In all the principal coal and metal mining districts enough miners and mine employes have now been trained to permit the quick assembling of a large number of men trained to assist in mine recovery work.

Where such arrangements are made possible the bureau will furnish rescue apparatus from its nearest station or car, and the trained engineers and miners of the bureau will be on hand as soon as they can be to direct or advise and assist in conducting in the safest manner the exploration of the mine for recovering entombed miners and for locating any fires. The bureau's men will work under the direction of the official in charge, or of

the State Inspector, but will take only such responsibility as pertains to safe methods and the work of the rescue crews wearing breathing apparatus.

Evidently mine operators should provide local rescue stations at individual mines or a joint station for a group of mines, and equip the station with rescue apparatus ready for immediate use, so that they need not depend on the bureau's apparatus, which may have to be transported many miles, and not reach the scene of the disaster until after many hours or the greater part of a day.

LABOR REPRESENTS MORE THAN HALF OF COAL'S PRICE

Labor is the item of largest importance in the business of producing coal. It is generally considered that the mining rate—that is, the contract price paid the miner for loading out the coal—is about one-half the cost of the coal on board the railroad cars, or one-half the mining cost. When to the miner's compensation is added the cost of the day labor in and about the mines, it is seen that considerably more than one-half the total cost of a ton of coal is due to labor.

The average daily output per employe varies in different districts and is determined by a number of factors, among the most important of which are thickness of coal bed, use of mining machines, efficiency of labor, and particularly efficiency of management. The average daily output has exhibited a steady upward tendency and in the period from 1900 to 1915 has declined but four times—in 1901, in 1903, an abnormal year in coal mining because of the anthracite strike in 1902, and in 1907 and 1913, both record years for the coal industry as regards quantity of output. Undoubtedly this improvement is due to better methods of mining, involving not only the greater use of cutting machines but also improved haulage systems and other mechanical and engineering features. When the demand for coal is slack and prices fall off, there is incentive to conserve labor; but when every effort is directed toward increasing output to meet strong demand at rising prices, efficiency is allowed to slacken. Such conditions account for the decline in the quantity of daily output per employe in 1907 and 1913.

The average annual output per employe depends upon the daily rate and the number of active days. The best efforts of all concerned cannot greatly affect the daily rate within any short period, and record outputs are therefore obtained by increasing the number of men and by working the mines a greater number of days. The total number of men engaged in mining bituminous coal has, with a few slight exceptions, shown increase in each succeeding year from 1900 to 1914, and the average number of days the men worked has varied up or down with the increase or decrease in the total production.

The record for 1915 presents a striking exception to the general tendency, for although there was (compared with 1914) an increase in total output, accompanied by a greater number of active days, the number of employes decreased notably. When considered in connection with the statistics of previous years, this decrease is seen to be abnormal and indicates at least the beginning of a shortage in labor, substantiating the views of those in the industry that such a shortage was imminent during the closing months of 1915 and was not seriously felt only because of the halt in production caused by the shortage in cars.

With the increase of wages that were made in April, 1916, and the opportunity for more than the usual number of days' work, the coal miners are sharing very fully in the general prosperity of 1916.

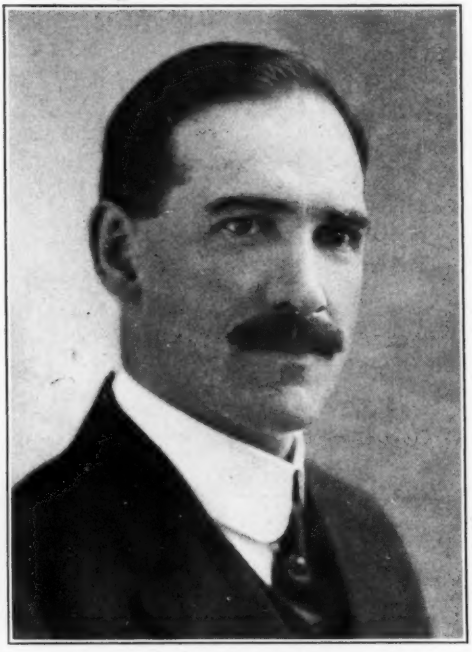
DR. W. R. WHITNEY

Research expert of the General Electric Company, who will speak on "Necessity for Research Work in the United States."

BAIN EN ROUTE TO CHINA TO EXAMINE MINES

H. F. Bain, formerly editor of the Mining Magazine, of London, was in Washington recently. Mr. Bain is now engaged in professional work and is en route to China where he will make examinations of properties. He also expects to do some professional work in Siberia before returning to the United States.

W. C. Phalen, who recently joined the division of mining technology of the Bureau of Mines, has begun work on a special treatise on salt. Later he will have a similar report on manganese.



DR. F. G. COTTRELL
Chief Metallurgist, Bureau of Mines

IRON ORE TONNAGE THROUGH SAULT CANAL TAKES BIG JUMP

An increase of nearly 2,000,000 tons of iron ore passed through the Sault Ste. Marie Canal during September, a report to the Department of Commerce shows. There was also a healthy increase in the amount of copper shipped by the way of the canal. Pig iron shipments more than doubled. West bound coal increased markedly. This applies to both bituminous and anthracite.

During the six months ending with September, there was an increase of iron ore from 33,761,752 tons in 1915 to 47,370,350 tons in 1916. West bound bituminous coal for the six months ending September, 1916, was 11,030,178 tons as compared with 8,106,063 tons in 1915.

Firm Changes Name

G. L. Simonds & Co., of 230 South La Salle Street, Chicago, announces a change in name. In the future the company will be known as the Vulcan Fuel Economy Co.

The corporation simply adopts a new name. The personnel and policies of the organization remain the same. The only change, in addition to that of the name, is an increase in capital.

MORE THAN HALF BITUMINOUS COAL MINED BY MACHINES

The proportion of machine-mined bituminous coal to the total putput has increased each year. In 1915 the proportion was 55 per cent, twice that of 1903, twelve years before, and the number of tons so mined in 1915 was more than three times that in 1903. It is interesting to note that among the nine States ranking highest in order of bituminous production—that is, producing 8,000,000 tons or more—all but two, Alabama and Colorado, showed more than half mined by machines; and that among all the other States only two, Montana and Michigan, recorded like proportions.

FOSTER WANTS ACTION ON BILL AT SHORT SESSION OF CONGRESS

Efforts will be made by Dr. Martin D. Foster, chairman of the Committee on Mines and Mining, to get action on his bill, providing for the revision of the mining code, at the short session of Congress. All members of the Committee on Mines and Mining have been asked to meet in Washington ten days prior to the meeting of Congress so that consideration of the bill may be begun at that time.

H. E. WILLARD
Who will speak on "Cooperation."

MOVEMENTS OF COAL LAST MONTH EXCEEDED SHIPMENTS OF 1915

The following is a statement of carloads of bituminous coal and beehive coke that originated on forty-nine railroads in September, 1916, compiled from reports received by the Geological Survey, prior to noon, October 16.

Comparative figures are based on reports of 49 roads for September, 1916.

	Sept., 1916.	Aug., 1916	Sept., 1915.
Carloads of bituminous coal	441,256	455,453	437,267
Carloads of beehive coke (9 roads)...	54,664	51,834	46,976

September, 1916, showed an increase in shipments of bituminous coal of 0.9 per cent over September, 1915, and a decrease of 3 per cent from August, 1916. The increases in shipments of beehive coke for the same month were 16 per cent and 5 per cent, respectively.

The heavy movement in August is thought to be due to unusually large purchases when the railroad strike was threatened.

BUREAU OF MINES ENGINEER DIES IN AN EFFORT TO REACH ENTOMBED MEN

In an effort to reach entombed men in the mine of the Jamison Coal and Coke Company, at Barrackville, W. Va., Lewis M. Jones, one the Bureau of Mines mining engineers, was overcome and died before he could be removed from the mine.

Mr. Jones was born in Cleveland, Ohio, and took up his residence in Pittsburgh after he entered the employ of the Bureau of Mines, February 15, 1909. He was a graduate of the Columbia School of Mines, New York City, and was an honor man in his studies. He leaves a wife and one child.

"The death of Mr. Jones is a heavy blow to the Bureau of Mines," said Director Manning. "He was a mining engineer of exceptional ability and was perhaps the best man we had in directing rescue work at disasters. Under the chief mining engineer of the Bureau, Mr. Jones had charge of the experimental mine of the Bureau at Bruceton, Pa., a few miles outside of Pittsburgh, and in this capacity developed many safeguards that are not only saving life in the coal mines, today, but will be instrumental in the saving of thousands of lives in the future. It was at this mine that the coal operators of the United States received their first real impressions of the destructiveness of an explosion of coal dust without the presence of gas and were given demonstrations as to the methods to be pursued in preventing such disasters. As a result of Mr. Jones' efforts, there has been a great decrease in the number of dust explosions. The fact that the death record among the miners last year was the lowest in the last sixteen years emphasizes the worth of Mr. Jones' efforts in behalf of the miners.

"Mr. Jones had been an important factor in the development of more orderly and safer methods of rescue work. He dies a martyr to the cause, like three other rescuers of the Bureau have died.

"The roll of Bureau of Mines heroes who have given up their lives to save others now includes Joseph E. Evans, rescuer, killed at Throop, Pa., April 7, 1911; John Ferrell, killed at Cherry Valley mine, Cherry Valley, Pa., January 20, 1912; Edward Evans, killed at Rock Springs, Wyo., September 30, 1913; and Mr. Jones, killed this morning at Barrackville, W. Va."

Fuel Oil Hurts Texas Coal

Coal mined in Texas competes with fuel oil and natural gas and also with coal from Alabama and from New Mexico and Colorado, and the increased use of fuel oil and natural gas has had the effect of decreasing the demand for coal in that region.

IMPORTATIONS BLAMED FOR DROP IN THE PRICE OF ZINC

Continued activities are reported from the mining fields, except those producing zinc, the low price of which continues, says the October report of the Kansas City Bank to the Federal Reserve Board. A dependable authority claims that it is now established that the drop in prices is caused by importations, Australia sending 30,000 tons monthly and Mexico 15,000 tons monthly to the smelters. The greatest activity in this district is in the Miami field in Oklahoma. Joplin, the center of this mining district, has been undergoing a great building boom, indicating that the temporary mining slump has had little effect on commercial activity. The production in the Joplin district for the thirty-six weeks of 1916, ending September 10, had a total value of $23,881,158, whereas the value of the total production for the entire year, 1915, was but $26,038,650.

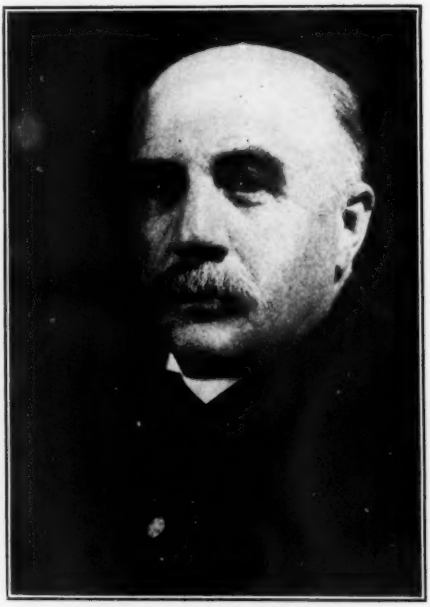
The Cripple Creek (Colo.) district shows a production for the month of August totaling 95,268 tons, with a bullion value of $1,294,342. The increase over July approximates 10,000 tons and $100,000 in valuation. Colorado mines during the first six months of this year gave employment to 15,000 men, an increase of 50 per cent over the number of men employed in the same period in the 1915. Sixty-four mining companies in this State are said to have paid out in excess of $80,000,000, and this does not include all the mines in operation.

The recent increase of 6 cents in the price of silver means an average increase of about 15 per cent in net earnings of the average silver producer. Colorado marketed 1,505 tons of ore and concentrates of tungsten, valued at $3,648,000, the first six months of this year, according to figures very recently made public. The mining outlook in the Goldfield (Colo.) district is affording the utmost satisfaction to those interested in the development work in that district. Two flotation plants, with a combined capacity of 1,200 tons daily, are now in operation. This is a system of recovering ores by oil flotation, by which system deep-level ore can be treated at low cost and with a high extraction of the metallic contents.

Labor conditions are generally upon a satisfactory basis. Unsettled conditions have prevailed in the ranks of mine laborers, but most of the differences have been amicably settled through conferences. One such conference involved the action of 35,000 miners.

Production Fluctuates Slightly

Anthracite is a fuel of domestic use and does not enter into the industries like bituminous coal, and therefore does not respond, save in a general way, to the influences affecting trade. The rate of production is not subject to the variations that attend bituminous coal, but the average value shows much the same tendency noted with soft coal, although the range is much greater.



THEODORE F. VAN WAGONEN

Who will speak on "Extralateral Rights"

Phosphate Rock Output Decreases

The phosphate rock marketed in the United States in 1915 amounted to 1,835,667 long tons, valued at $5,413,449. Compared with the production of 1914, which was 2,734,043 long tons, valued at $9,608,041, this was a decrease of 898,376 long tons, or nearly 33 per cent, and in value of $4,194,592, or nearly 44 per cent.

Less Demand for Kansas Coal

In common with the other coal-producing States in the southwestern territory Kansas depends on the railroads as the principal market for its coal. The well-directed efforts of the railroad officials in effecting economy in the use of coal and the large use of oil as fuel have tended to curtail production of coal in the southwestern area during the last few years.

Delivers Geological Lectures

E. W. Shaw of the Geological Survey recently delivered several geological lectures at the University of Chicago. While in Illinois he paid a visit to the gravel and clay deposits of southern Illinois. He also visited oil and gas fields of eastern Kentucky where the Survey is beginning a general study.

MUCH CLASSIC COPPER GROUND INSPECTED BY MINING ENGINEERS IN ARIZONA

Trip Under the Auspices of the American Institute of Mining Engineers Reported to Have Been a Great Treat—With Mines Working at Capacity and Smelters in Full Blast Opportunities for Inspection Were Good

By Joel H. Watkins,

Geologist, Southern Railway Co.

The Arizona meeting of the American Institute of Mining Engineers has been voted by many, the most successful and enjoyable in the history of the institute. The committee on arrangements who enabled us to see so much classic copper ground in such a short time is certainly to be congratulated, and the committee on transportation is also due a vote of thanks for the excellent train service and dining-car service throughout the entire trip.

The train which left New York on September 14, with only one special Pullman, by the time it reached Bisbee on September 20, had fourteen special Pullmans—including two private cars. The greatest number of men on the train at one time is reported to have been about 210.

Mr. Carl Scholz, president, American Mining Congress, and manager, Mining and Fuel Department, Chicago, Rock Island and Pacific Railway Company, shortened the hours between Chicago and El Paso by distributing through the train maps showing the mineral resources of the Rock Island System and personally calling attention to points of interest visible from the train.

We arrived at El Paso about 3 o'clock on the afternoon of Sunday, the seventeenth, and were met at the train by a large reception committee who took us directly from the train in private autos through the military camps, where some 120,000 soldiers were under canvas, and then through the beautiful residence section of the city. Later in the afternoon we were conducted by Mr. Karl Eilers through the smelting plant of the American Smelting and Refining Company. In the evening we were entertained at the Toltec Club where we were given a typical Mexican dinner.

MENU

TORONJA
ENCHILADAS CON HUEVOS
TAMALES DE POLLO
TORTILLAS
FRIJOLES REFRITOS
NIEVE NAPOLITANA
QUEQUI
CAFE

The trip from El Paso to Santa Rita was made over night, and after breakfast at Santa Rita on the morning of the eighteenth, we were given a bird's-eye view of the enormous open cut workings of the Chino Copper Company from open-air cars over the company's mine tracks. After the open-air excursion, a part of the party made a closer inspection of the open cut workings and ore bodies of the Chino Copper Company, and others made the trip across country to the mine and mill of the Empire Zinc Company. An excellent barbecue dinner was served under canvas, and the company's garage was turned into an open bar where refreshments named for the distinguished members present were served free to everyone. After dinner the train was moved to Hurley and the afternoon was given up to an inspection of the Chino concentrating mill. In the evening a dance was given in a large open air pavilion in honor of the ladies attending the meeting.

Arriving at Douglas about 7 a. m., on the morning of the nineteenth, we inspected the reduction works of the Copper Queen Consolidated Mining Co., and in the afternoon the reduction works and acid chambers of the Calumet and Arizona Mining Company.

Late in the afternoon the first technical session was held. Subjects: Leaching and Smelting. Those who did not care to attend the technical session availed themselves of the opportunity of motoring into Mexico and viewing the recent battlegrounds and trenches around Agua Prieta. In the evening there was a dance at the Country Club in honor of the ladies.

At Bisbee, on the twentieth, the party was divided into two groups. Those most interested in mining methods took the underground trip at the Calumet and Arizona properties, and those most interested in geology took the underground trip at the Copper Queen mine in Sacramento Hill. Dinner was served at the Copper Queen Hotel, after which the second technical session was held. Subject: Mining and Geology.

In the evening there was a banquet given by the local members to the visiting members at the Warren Country Club.

At Globe we were camped for two days. Thursday, the twenty-first, we visited the mines and reduction works of the Old Dominion Copper Company, held the third technical session. Subject: "Concentration and Flotation."

On Friday, the twenty-second, we visited the mines and mills of the Miami and Inspiration Copper Companies, and the reduction works of the International Smelting and Refining Company. Luncheon was served at the Country Club, and late in the afternoon, the fourth and last technical session. Subject: "Mining and

Smelting." In the evening a banquet and dance were given by the local members.

On Saturday, the twenty-third, almost the entire party took the automobile trip over what is known as the Apache Trail, from Globe to Phoenix via the great Roosevelt dam. The entire distance is about 120 miles over most of which the scenery is very wonderful. After spending an hour or more about the dam, we passed along the government road down the gorge below the dam to Fish Springs where we had dinner. One of the most impressive features of the day was passing suddenly from a flat desert country east of Phoenix, into the beautiful green irrigated country around Phoenix. We were some 7 or 8 hours late reaching Grand Canyon on Sunday, the twenty-fourth, so the party voted unamimously to stay over until Monday night. On Monday a large party made the trip down to the bottom of the Grand Canyon via the Bright Angel Trail, while others visited different points of interest along the run. From this point the party was practically disbanded as all that remained was the journey homeward.

To the members of the Institute the trip afforded a most unprecedented opportunity to study copper mining and smelting methods under the best conditions as all of the copper mines and smelters are now running at full capacity. Both the mining and smelting companies certainly tried to out-do themselves in throwing open the doors and offering every possible facility for the members to study their practices in both mining, concentrating and smelting. The visiting members were divided into groups and personally guided through the different departments by superintendents, who explained in detail every phase of treating the ore from the time it is broken in the stopes until the metal itself is cast in moulds. Although the attendance was considered good, it certainly seems to me that a larger number of members would avail themselves of this splendid opportunity to study, geology, mining and smelting—particularly the younger men. Among some of the more prominent men present at this meeting were: Dr. L. D. Rickets, president of the Institute; B. B. Thayer, past president; Bradley Stoughton, secretary; Geo. D. Barron, Philip N. Moore, J. S. Jennings, Walter Douglas, John C. Greenway, L. O. Howard, Karl Eilers, Carl Scholz, Arthur Natman, E. P. Matheson, C. W. Goodale, Forest Rutherford, and Julius Kruttschnitt, Jr.

Hoovers to Open New York Office

Theodore J. Hoover will open an office in New York in the near future to represent the various companies in which he and his brother, Herbert V. Hoover, of London, are interested.

GEORGE OTIS SMITH TO ADDRESS GEOLOGICAL SOCIETY OF AMERICA

George Otis Smith, Director of the Geological Survey, will present a paper on "Geology and Public Service" at the December meeting of the Geological Society of America. This meeting will be held at Albany, N. Y.

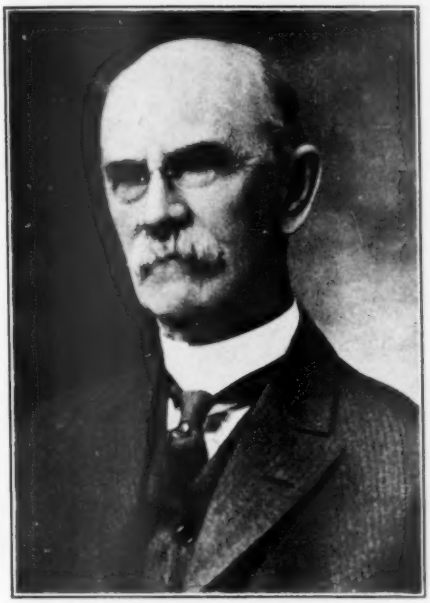
THREAT OF STRIKE SENDS BIG COAL TONNAGE TO STOCK PILES

The improvement in business to which the increase in production of coal has been attributed did not begin in all regions at the same time nor was its influence everywhere equal, it is pointed out by C. E. Lesher of the U. S. Geological Survey. It is evident that one of the most potent factors was the demand from the warring nations for foodstuffs, commodities, and manufactures of almost every kind, as well as for munitions of war. This demand was soonest felt in the manufacturing districts lying north of the Potomac and east of Chicago, inclusive. Hence the coal fields from which the fuel for for this territory is mainly drawn showed the greatest progress in 1915. There was another cause for increased output of coal, particularly in the area mentioned, the influence of which was felt perhaps as early as August and continued in effect through the first three months of 1916, namely, the storage of coal by those consumers whose supplies come from the "unionized" coal fields in which the old wage agreements were to expire April 1, 1916. There was considerable apprehension with regard to the successful negotiation of new agreements, and the possibility of a shutdown of the mines caused many consumers to adopt a policy of preparedness; as a result the buying of coal was for a period in excess of the needs for immediate consumption. The movement was initiated by the railroads and users of steam coal, particularly manufacturers with large contracts to fill, soon followed their lead. Although only incomplete statistics of storage are available, there is evidence to indicate that between the late summer of 1915 and the end of March, 1916, not less than 10,000,000 tons of bituminous coal were put into stock piles and the quantity may have been nearly 15,000,000 tons.

Jeffrey Issues New Bulletins

Bulletin No. 191 of the Jeffrey Manufacturing Co. contains interesting installation views and describes the latest improvements in the Jeffrey 29-B "Arcwall" type of coal cutter for "overcutting" system of mining, which is self-contained and self-propelled—is adjustable in all directions —will cut in the coal, dirt or shale bands, and can be built to cut anywhere above the top of rail.

Bulletin No. 192 contains full instructions for the care and operation of the Jeffrey 35-B, latest type of shortwall coal cutter, which has been designed to meet the demand for a simple rugged medium weight machine having features which make it quickly and easily handled. This bulletin also features the Jeffrey self-propelling hand truck, which permits of unloading the machine at any angle to the truck and on a spot which will require the least amount of time to handle it into the proper position for cutting.



SENATOR CHAS. S. THOMAS

Who will speak on "Mining Law Revision."

LINE BETWEEN SEMI-BITUMINOUS AND SEMI-ANTHRACITE NOT CLEAR

There is no generally accepted definition of semi-anthracite and semi-bituminous coal, with a distinct line drawn between the two. A number of systems which distinguish between the two classes of coals have been presented at different times. The earliest of these and the one that has been most widely quoted is that of Persifor Frazier, who proposes the following classification on the basis of the fuel ratio, that is the fixed carbon divided by the volatile matter: anthracite 100 to 12; semi-anthracite 12 to 8; semi-bituminous 8 to 5; bituminous 5 and less.

Survey Bulletin 326, on page 99, contains two analyses. One analysis was obtained by the old State Survey under Dr. Branner, from an averaged sample obtained by Arthur Winslow. That sample gave a fuel ratio of 8.96 which would throw the coal well within semi-anthracite class. The Collier samples gave 7.3 and 8.0. The average of the three fuel ratios is 8.0, or exactly on a line between the two classes, according to the Frazier classification.

A later proposed classification by M. R. Campbell on limited data, so far as the anthracite coals were concerned, is based on the ratio of total carbon to total hydrogen. He proposed for semi-anthracite from "26 (?) to 23 (?)," and for semi-bituminous "23 (?) to 20 (?)." According to analysis 3,176 the carbon-hydrogen ratio of this coal is 22.1 which would throw it into the semi-bituminous class, according to Campbell's scheme.

At the Thirteenth International Congress at Toronto in 1913 coal was the central theme. In a scheme drawn up for the classification of coals to be used in the papers presented before that Congress, the fuel ratio was used but the line between the semi-anthracite and semi-bituminous classes was drawn at 7 instead of at 8, as in the Frazier classification. On this basis the Bernice coal is safely semi-anthracite. (See Coal Resources of the World, Vol. 1, p. 11.) In volume 2 of the work just quoted, page 527, M. R. Campbell, describing the coals of the United States, says:

"The general practice today is illustrated by the following table: bituminous coals 0 to 3; semi-bituminous coal 3 to 6.5 (?); semi-anthracite 6.5 to infinity."

In Pennsylvania the line between the semi-bituminous and semi-anthracite coals lies in a gap between the Bernice (Pa.) Basin, the coals of which have always been taken as typical semi-anthracite, and the Blossburg Basin, a little further west, which are typical semi-bituminous. According to recent analyses, the coals of the Bernice (Pa.) Basin have a fuel ratio of from 8.1 to 9. The Blossburg coal has a fuel ratio of between 3 and 4. The Pocahontas coal of Virginia and West Virginia, which is generally quoted as a typically semi-bituminous coal, has a fuel ratio commonly under 5. The New River coal, also put in that class, has a fuel ratio of from less than 4 to over 5. The Smokeless George's Creek coal of Maryland runs from less than 4 to over 5. The Cambria County (Pa.) smokeless coal, runs from about 3½ to just over 5. With the exception of the Bernice coal, which, however, is classed in the market as anthracite, these coals are all classed as semi-bituminous coals, but it will be noted that none of them go more than a very little above 5.

It would therefore seem that the most typically semi-anthracite coals of the East average between 8 and 9 in fuel ratio, while the most typically semi-bituminous coals of the East range from 4 to 5. It would therefore seem that the line should be drawn more or less nearly half way between or around 6.5 to 7. This assumes that the fuel ratio is a fair indication of the class to which a coal should be assigned. It has always been considered the best criterion for the high fixed carbon coals, and the only one that has been extensively used.

Physically, the Russellville coal differs quite markedly from the typical Pennsylvania anthracite, for apparently the same mountain-building forces that cemented the latter into a tough "hard coal" have fractured and splintered the Russellville coal into a tender coal. The same tenderness, however, characterizes the Pennsylvania Bernice semi-anthracite. While the fuel ratio alone, judged by the Frazier scheme of classification, is uncertain, yet, taking the broader view of actual usage, which view was intended

to be the basis of the Frazier classification, it would seem almost certain that the Bernice, Arkansas, coal should be classed as a semi-anthracite.

BUREAU OF MINES LIBRARY CONTAINS 11,000 VOLUMES

The Library of the Bureau of Mines, which will be housed in the new Interior Department, was organized early in 1911, soon after the Bureau was established. Since then there has grown from a collection of a small number of books and a library of about 11,000 volumes of chemical, technical, mining and scientific publications, which promises to become one of the most notable special library collections in the country.

Mrs. Edith F. Spofford, librarian of the Bureau, is a daughter-in-law of the late Librarian of Congress, Dr. Ainsworth R. Spofford. Her father was Judge William Harrison Safford, of Chillicothe, Ohio, a prominent jurist and writer on subjects relating to American history and biography.

Mrs. Spofford came to the Bureau of Mines from the Library of Congress after twelve years' experience in that great training school for librarians. At the time of her transfer, she was in charge of the catalogue of the Periodical Division of that library where she became familiar with the American and foreign technical and scientific literature.

For two years, Mrs. Spofford devoted her time to devising and perfecting a library system that would meet the requirements of the main library in Washington, and the branch libraries under supervision of the main library. With the rapid growth of the Bureau the wisdom of this course has been proved.

The main library in Washington is a clearing house for its various branches, as well as a central bureau for information, giving practical service to eight branches of the Bureau. Each station has its special collection of books, and maintains indexes of subjects pertaining to the work of that station. Library of Congress printed cards, as soon as available, are sent to the branch libraries for these indexes.

All books and publications belonging to the Bureau are catalogued and charged in the main library, the cards designating whether the book is in Washington, or at one or more of the stations.

In addition to ordering and distributing all publications received whether by purchase or exchange, the library endeavors to serve the specific interests of the scientific workers, by keeping in touch with individual investigations in the various branches, in supplying articles or books as requested, and in calling attention to other publications bearing upon such investigations. Opportunities for such service are increasing with the progress of the growth of the Bureau.

MRS. EDITH F. SPOFFORD
Librarian, Bureau of Mines

Mrs. Spofford had completed arrangements for attending the International meeting of librarians in Oxford, England, in August, 1914, when war was declared. At that time as an official representative of the Bureau of Mines, she had been authorized to visit the Government Mining Departments in England, France and Belgium, with the hope of obtaining for the Bureau valuable reports needed to complete sets of foreign mining statistics in the Bureau's library.

Appoints Kansas City Agent

The Jeffrey Manufacturing Company, of Columbus, Ohio, has opened an agency with the Gustin-Bacon Manufacturing Co., of Kansas City, in order to establish closer cooperation with their customers in Kansas, Missouri and Oklahoma, and improve their service there.

The Gustin-Bacon Company will carry a line of Jeffrey Transmission Machinery, Chains, Buckets, etc., in stock. J. S. Davidson, who has spent several years in the sales and engineering departments of the Jeffrey Company has associated himself with the Gustin-Bacon Company and will handle all inquiries for Jeffrey Products. His experience and training in the application of these products will enable him to be of great assistance to customers in solving their problems in elevating, conveying and transmission machinery, also crushing, pulverizing and screening equipment.

RALPH CREWS

Who will speak on "Cooperation in the Marketing of Coal."

CANADIAN COAL DISPLACING WYOMING PRODUCT IN NORTHWEST

Normally a considerable quantity of Wyoming coal from the Sheridan field reaches market in northern Montana, Idaho, and Washington (in and about Spokane), but Canadian coal now admitted duty free is reported to have partly replaced it and to that cause the decreased production in Sheridan County is partly due. Abundance of water in the Black Hills for the hydroelectric plants cuts off a part of the market for Wyoming coal.

BUREAU OF MINES MAN SAVES LIFE OF CITY OFFICIAL

The presence of W. J. German, of the Bureau of Mines, at the Cleveland water works tunnel, doubtless, is responsible for the saving of the life of the city director of the public utilities, P. S. Farrell. Mr. Farrell was overcome in the tunnel and Mr. German, by applying the Schaeffer method of resuscitation, was able to restore Mr. Farrell to consciousness after a short interval. Mr. German was given leave of absence by the Bureau so he could be retained temporarily by the contractors driving the tunnel.

PLACER MINERS SLOW TO MAKE RETURNS TO THE GOVERNMENT

After having sent out repeated requests the Geological Survey has been able to secure statistical information from only 20 per cent of the placer mine operators in the United States. This is the only branch of mining in which any difficulty is experienced by the Survey in obtaining information

It is possible for the Survey to obtain information as to production from indirect sources, but every effort is made to have the statistics correct to the smallest detail and this is possible only by securing the cooperation of the operator. In most cases where failure to make returns occurs, the operators have no objection to furnishing the Government the figures, but the return simply is neglected.

In the case of placer miners more reasons exist for the failure to reply to the cards of inquiry, than in any other class of mining. This is due to the fact that many placer mines are operated on a small scale and the operators do not remain long in one place. In this way it is difficult to reach them by mail and perhaps the property concerning which inquiry is made has passed from their hands.

There is no reason, it is believed here, why 80 per cent of these operators should fail to make returns. Evidently it is due to the disinclination on the part of some owners to give out figures as to production. Their failure to reply promptly to the cards sent out will not accomplish the end they evidently anticipate. It simply makes it necessary for the Government to go to the additional expense of sending a representative to the ground to learn for himself from outside sources as to the output of the property. This failure to make returns results in delaying important statistical reports on gold production.

ARIZONA ORES WILL BE SHOWN AT MINING CONGRESS CONVENTION

A mining exhibit will be shown under the auspices of the Arizona Board of Trade at the American Mining Congress Convention. The exhibit will be under the direction of the State Bureau of Mines.

Spain to Take More Coal.

According to Consul General Carl Bailey Hurst, of Barcelona, the Sociedad de Altos Hornos de Vizcaya, of Bilbao, Spain, has acquired three steamers at a cost of over $1,000,000. Two additional steamers, costing together $900,000, have now been added to its fleet. All these ships will be used by the company to transport foreign coal for its own works exclusively. At the same time this company has ordered two steamers at a cost of $360,000 each.

Phillip M. Riefkin, an engineer of the Bureau of Mines, is in the West inspecting fuel burning equipment.

UNUSUAL HEADWAY MARKS SUMMER'S WORK IN ALASKA

Unusual headway was made by the geological parties which worked in Alaska this summer. Alfred H. Brooks, in charge of the Geological Survey's Alaskan division, just has returned from Alaska with a flattering report as to the progress made in the territory.

Unusually propitious weather conditions made possible a larger amount of work than has been the case during any other summer. The spring was early and exceptionally good fortune was with the parties in making good connections with the river boats. These reasons added to an unusually dry summer made possible the unusual progress.

There were twelve parties engaged in work in the different portions of the peninusla. In southeastern Alaska a detailed survey of the Juneau district was completed. Owing to the importance of the operations in this district an examination was made more in detail than usual. Both topographical and geological maps were made on a scale of 2.64 inches to the mile. This mapping covers the area of the larger developments of the Juneau regions.

A reconnoissance of the southern portion of the Ketchikan district was finished. The Survey now has complete stream gauge records for a year and a half. This data has been gathered in cooperation with the Forest Service. From it, it is possible to judge that there are many important water power sites in this portion of Alaska. It can be said, however, that there are not as many power sites as had been anticipated, judging from the amount of the rainfall.

On Prince William Sound a topographical reconnoissance of the Port Wills district was completed. Unusually good weather marked the passage of the summer in this area and the progress made is described as remarkable.

The good weather extended also to the Copper River region where a continuance of geological work took place.

A detailed geological survey of the Nenana coal field was made. This is one of the three most important coal fields in Alaska. It will be pierced by the new railroad. This field necessarily will be the source of fuel for power purposes in the Fairbanks district.

Topographical and geological reconnoissances were completed of the Kantishna district which is 50 miles southwest of the railroad.

A detailed survey was made of the Marsha placer district. This is a new mineral area of the lower Yukon. Owing to their apparent importance reconnoissance surveys were made of adjacent areas.

Supplemental studies were made of the lodes at Fairbanks. Similar studies were also made at Nome. An interesting reconnoissance is reported by the party assigned to the Tolovane placer district.

Dr. Brooks himself spent two months in Alaska. His visit was confined to southeastern Alaska and the Prince William Sound country.

Copper production in Alaska continues to increase at an almost unbelievable rate. Every effort is being made to stimulate production to the utmost in order to take advantage of the high prices available.

The gold production promises to be about the same as last year. Important new territory is being prospected, however, and every indication points to the fact that Alaska will be a consistent producer of gold for many years to come.

Shipment of antimony has stopped entirely with the fall of prices.

Some scheelite is being developed in the Fairbanks district.

NO EARLY INCREASE IN OREGON COAL PRODUCTION EXPECTED

The only developed coal field in Oregon is in the Coos Bay district, on the Pacific coast. The only outlet at present for the coal is by boat, but the completion of the projected line of the Southern Pacific Company from Eugene to Marshfield will enable the Coos Bay output to reach wider markets. At present wood is largely used for domestic fuel in this territory and wood and oil are the principal fuels in the industries. The Coos Bay coal is sub-bituminous and cannot be used to any extent for bunkering. In view of these conditions no great progress is to be expected in Oregon coal production says the U. S. Geological Survey.

INVESTIGATES FAULTING IN SEVERAL MINERAL STATES

Sidney Paige, in charge of the western areal geology for the Geological Survey, has returned from an investigation in the San Juan mountains of Colorado, in the Grand Canyon, in the Yosemite Valley region and in southern California. With Robert T. Hill he has been paying especial attention to investigation of faulting. Mr. Paige also visited Lassen Peak and looked over certain features of vulcanism being manifested there. Mr. Paige paid a visit to the University of California while in the West.

Hold Markets With Difficulty

The coal fields of Tennessee are so hedged about by competing districts, in some of which the cost of mining is much lower, that it is with difficulty that the Tennessee operators are able to hold their old markets, and of course under these conditions new markets of any extent are not attainable except for some of the particularly high-grade coals.

Lyon Visits Chemical Show

Dorsey A. Lyon, who is in charge of the experiment work being done by the Bureau of Mines at the University of Utah, was in Washington last month. He attended the Chemical Show at New York.

SIXTY DEGREE GASOLINE DEVELOPS AS MUCH POWER AS THE 74 DEGREE PRODUCT

Van H. Manning, in Address, Points Out How Automobile Engines of Today are Being Constructed to Use a Much Lower Grade of Fuel Than Was Possible Two Years Ago—Casinghead Gasoline Discussed.

Speaking recently on the purity of gasoline, Van H. Manning, Director of the Bureau of Mines, said:

"The Bureau of Mines is in entire sympathy with your campaign for purity in gasoline, and wishes to be of aid, not only to all of you but to the entire country in this important matter.

"We are today facing a serious condition in the petroleum industry. We have probably reached the summit of our crude oil production in this country. According to the United States Geological Survey, our future supply of petroleum is only sufficient to last us from twenty-seven to thirty years at the present rate of consumption. This does not take into consideration any increasing demand as the years go by. In order to supply the fuel for the future automobiles, it will be necessary to make better use of our crude oil production in the future than we have in the past.

"In discussing the various problems involved, we must bear in mind that while the demand is steadily increasing, the production of crude oil, which is the raw source of the gasoline, is remaining approximately stationary if it has not been declining in the past year. A year ago gasoline was selling at 11 cents a gallon and was a drug on the market, due to the tremendous production of gasoline-rich crude produced by the Cushing Field in Oklahoma. This production, however, has declined from over 300,000 barrels of crude oil per day to less than 60,000 barrels per day.

"The Cushing crude contains from 25 to 30 per cent of gasoline. The new production which has compensated for the decline in the Cushing production, contains but from 15 to 17 per cent of gasoline. Notwithstanding the decline in the production of gasoline, the demand has steadily increased, due primarily to the increased use of the automobile. On January 1, 1916, there were two and a quarter million automobiles in use in the United States. It is estimated by the automobile manufacturers that there will be in excess of three and a quarter million in use by January, 1917, and by January, 1918, there will be in excess of four and one-half million automobiles in use. These figures are in addition to the increased use of motor trucks, farm tractors, stationary gasoline engines, motor boats, etc.

"This increasing demand for gasoline has been met partly by the automobile engineers and refiners. The automobile engineers have improved their automobile engines and carburetors, making it possible to use heavier fuels in the automobile of today, which would have been impracticable a year or two years ago. The refiners, taking advantage of the work of the automobile engineers, have been able to use heavier oils for gasoline, thereby increasing the percentage of gasoline obtainable from the given amount of crude oil. This has resulted in increasing the end point from 150° Centigrade, the end point of a year ago, up to an end point of 175° to 200° Centigrade, the end point of today.

"Let me explain to you what is meant by the 'end point' in gasoline. The end point is a term used in distillation of gasoline and is usually considered to be the temperature at which 95 per cent of the gasoline will distill off, if distilled in a proper flask at the proper rate. Recently the Bureau of Mines purchased four samples of gasoline sold in the District of Columbia. These gasolines were analzyed and the end point determined in each instance. The gravity of one was 64.8. The gravities of the other three samples ranged from 61.5 to 62. The end point of the first sample was 210° Centigrade. The end point of the other three samples was 175°. The high end point of the first sample, together with its high specific gravity indicates that this is a blended gasoline. This is further borne out by the analysis, which indicates that 21 per cent is distilled over under 75°, whereas less than 10 per cent on the other three samples is distilled over at this same temperature. This larger proportion of light products, which is responsible for the high gravity, indicates that casing head gasoline has been blended with heavy distillate, because the end point of this gasoline is 210°, as against 175° for the other three gasolines analyzed. It is possible that this blended gasoline might prove satisfactory in some automobile engines.

"The end point is important because it is a measure of the readiness of the gasoline to vaporize, which is necessary and desirable information to have in selecting suitable fuel for gasoline engines. As a result, the refiners have been able to supply a lower grade fuel, which is now adaptable to the improved automobile engine. This, of course, automatically has a tendency to keep the price of gasoline down, as it can readily be seen that if the standard of quality is higher, the supply would be more limited and correspondingly higher in price.

"This will probably explain some of the difficulties that the people are having with the

character of the fuel used in their automobiles, at the present time, particularly if the automobile is of a design of two or more years ago, not having the improved engine and carburetor design, it is not equipped to use the present-day low grade of fuel.

"Refiners are cooperating along another line to the same end, namely, to increase the amount of gasoline and at the same time to keep the price down to a reasonable basis, by means of cracking kerosenes and heavier oils, thereby converting a certain proportion of the crude oil which was not formerly utilized for the purpose, into gasoline. Last year there was produced by by cracking processes approximately 2,000,000 barrels of gasoline. This year it is estimated that there will be produced more than 5,000,000 barrels of gasoline by cracking processes. This is all the more striking when it is considered that these 5,000,000 barrels of gasoline were made from oils which in the past did not enter into the making of gasoline, and indicates the possibilities of the present production of crude oil to supply the future requirements of the automobile.

"So, gentlemen, you can see that these are some of the problems that have to be taken into consideration in any specifications that are drawn up. We want to assure you as nearly as we can that you get a grade of gasoline that will be satisfactory for your needs; then we have to be sure that it is of such a grade as can be supplied by the refiners at a reasonable price. Unless the specifications do take these factors into consideration, they may result in restricting the supply and making the prices exorbitantly high, and also may deprive many people of the pleasure of owning a motor car by making the price of fuel prohibitive. With proper development of the cracking processes, and the cooperation of the automobile engineer, there is no reason why a suitable fuel should not be available for years to come and at a reasonable price.

"The Bureau of Mines has for a number of years appreciated the seriousness of the motor fuel problem; in fact, long before the sharp increase in prices of gasoline, this Bureau was aware of the conditions, and realized that this increase in prices would follow. It was at that time the Bureau began a serious investigation of this entire problem. The special investigation bearing directly on the quality of gasoline was begun eight months ago and is being continued today. Samples of gasoline were purchased in the open market in all parts of the country (and not from refiners), and were analyzed by the Bureau's engineers, and engine tests were also run on the representative grades of gasoline. The results to date are contained in a publication to be issued in the near future by the Bureau of Mines. There is also in course of publication, and nearly completed, a report on gasoline specifications, which has taken into consideration the available supply, increasing demand, and the protection of the public, as well as fair treatment to the refining industry—all with the purpose of assuring a future supply of gasoline to the public at the most reasonable prices.

"One of the results that may prove startling to the public is that the gravity of the gasoline does not of itself necessarily mean a satisfactory basis for the purchase of gasoline. Engine tests were run by the Bureau on gasoline having a gravity of from 74° to 60°. The net result of these tests showed a difference in power developed of less than 2 per cent between gasolines of 74° gravity and gasolines of 60° gravity. This is all the more remarkable when it is considered that 74° gravity gasoline is selling at 31 cents per gallon, while the 60° gravity gasoline can be purchased at 22 cents per gallon.

"It is probable that the 60° gravity gasoline, which can be purchased for 9 cents less a gallon, can be used in the automobile with the same satisfaction as the 74° gravity gasoline.

"All gasolines, under properly regulated engine conditions can be made to develop quantities of power which are not greatly different. This result was obtained from experimental work in our laboratories in Pittsburgh, and indicates that the claims made by many refineries for the power producing qualities of their gasoline are largely without foundation. It does not necessarily follow that all gasolines are equally good, but it is certain that exaggerated claims are made for the number of miles per gallon. The possible element of superiority undoubtedly lies in the quality some products have of giving maximum efficiency over a wider range of engine conditions. The fact of importance is, therefore, that if the user of gasoline takes sufficient care of his engine, he can obtain almost as good results from a cheap gasoline as from an expensive, high-test product, as the power developed under like conditions varies little in our experiments.

"Recently, owing to the remarkable development of the casing head gasoline industry, that is, obtaining gasoline from natural gas, there has been obtained a product called 'blended' gasoline. The casing head gasoline as derived from natural gas is too volatile to be used directly. It is therefore mixed with oil just a little lighter than kerosene but heavier than gasoline. Such a blended gasoline may be of any gravity desired by the manufacturer, but is naturally different in composition and properties from the straight refinery product which it may chance to resemble in gravity only. This is due to the fact that it is generally composed of more of both of the heavier and lighter oils than gasoline made by the ordinary processes. On account of the larger proportion of light oil, it is possible to use a correspondingly large proportion of heavy oil and still have an average gravity the same as ordinary gasoline, but which may act very differently in an engine on account of the large portion of heavy oil contained in the blended product. This is not intended to discourage the use or manufacture of casing head gasoline. If the casing head gasoline is blended with the proper oils, that is, oils that are not too heavy, it can be used satisfactorily in an automobile engine. Casing head gasoline is an important addition to our fuel oil resources, the production amounting to approximately 5 per cent of the total production of gasoline this year.

"The Bureau of Mines is now preparing gasoline

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specifications for the General Supply Committee of the Federal Government, which will undoubtedly be of interest to all users of gasoline. These specifications should be issued within the next ninety days, and I shall be very glad to see that the members of the Retail Merchants' Association receive copies.

"For your information, I might also say that the Bureau of Mines has a complete testing laboratory, equipped with engines and other necessary apparatus, with which it will be possible to make power tests on gasoline, as well as on other internal combustion engine fuels. The results of these tests will be available to the general public, and will be of the utmost importance in clearing up the difficulties with which you are confronted today.

"The Bureau of Mines has arranged to cooperate with the Curtiss aeroplane manufacturing concern to test their gasoline in order to arrive at a satisfactory gasoline for aviation purposes for use by the United States Government. Of course, this is a gasoline for a special purpose, and of a character in which the average automobile user is not interested.

"In conclusion, gentlemen, I wish to emphasize the necessity of bearing in mind the following consideration in your efforts to obtain purity in gasoline. We must keep before us the fact that there should be the greatest possible use of the raw materials consistent with economic results. For instance, no specifications should be drawn up which would exclude certain materials now being used satisfactorily, for if eliminated, this would correspondingly restrict the supply and automatically increase the price. This of course, is not desirable. The Bureau is exceedingly anxious that all the available resources for the making of gasoline be used to their greatest extent, and it is also interested in the encouragement of further economy in the design of the automobile engine. Any specifications that would restrict the use of some of the low-grade oil resources would at once stop any further efforts toward improvement in engine design. At the same time, the Bureau is interested in seeing that the public obtains a satisfactory fuel.

"To these ends, the entire facilities of the laboratories of the Bureau of Mines are at your disposal. I wish you great success in your undertaking."

SAYS GOVERNMENT'S PUBLIC LAND POLICY IS SOCIALISTIC

A case that has attracted much attention among lawyers was argued in the United States Supreme Court last week. The Government brought suit against power companies in Utah to oust them from the public lands. The interest of the United States was shown by the fact that briefs were filed on behalf of the State of Utah and five other States, setting up their right to control the use of their waters as a part of their general powers to govern their internal affairs. This claim of the Western States is based upon their admission into the Union on an equal footing with the original States.

"It is not generally known, I presume, that 80 per cent of Utah is still public land," said H. J. Dawes, a lawyer of Colorado, in discussing the case, here. "So in Colorado, I think, fully two-thirds of the State is public land. All of the Western States have great reservations, and the conservationists have gone plumb crazy in their efforts to keep the land from settlement or even improvement. The case now before the Supreme Court involves the right of the States to control their own land. The Federal Government has pursued a policy which gives it almost absolute control over all privately owned land in the event enterprise seeks to obtain concessions from the Government. For instance, if a corporation or other owner of land contiguous to public lands in carrying out a project seeks a roadway across a strip of public land, be it ever so small, the Government will not grant the right until the corporation or owner signs a contract under which the Government in reality becomes the dominant power over the privately owned land, reserving the right to dictate the sale of the land to whomsoever it names, and in any event to become the owner in fifty years. It is really a form of government socialism, and the Western States want to find out whether they have a different status from the other States simply because they happened to come into the Union later."

CONGRESS TO BE ASKED FOR PETROLEUM EXPERIMENT STATION

An effort will be made to induce the next Congress to appropriate for a petroleum experiment station. This station will be devoted to testing, cracking, refining and dehydrating petroleum, if it is allowed.

NATION'S FIRST COOPERATIVE SELLING AGENCY ORGANIZED

Formation of the first organization for cooperative selling to give an American industry an advantage over foreign competitors in foreign markets was announced by the Bureau of Foreign and Domestic Commerce. The organization consists of an export sales company representing 80 per cent of the Douglas fir cut in this country, and the bureau considers that it will give American lumber a decided advantage in the trade struggle that will follow the war.

"The American campaign to capture foreign lumber markets has resulted in the organization of an export sales company by Western lumber manufacturers," said a statement issued by the Bureau. "This company represents 80 per cent of the Douglas fir and Western hemlock in the world's lumber markets."

"It is expected, without violating the present anti-trust law, to give American manufacturers some of the advantages that were hoped for from the Webb bill, which the last Congress failed to pass.

"The organization of this company is regarded as the most important and far-reaching step the industry has taken to broaden its markets and meet the competition of the thoroughly organized lumber exporters of northern Europe. In conjunction with the investigation of European lumber markets recently undertaken jointly by the lumbermen and the bureau of foreign and domestic commerce, it should give American lumber a decided advantage over all competitors in the trade struggle that will follow the war.

"Immediate attention will be given to standardization of grades, to the conditioning of export lumber and an active propaganda in foreign countries. Lack of attention in the past to these very important details accounts in large measure for the failure of American lumber to hold its own against more efficient competitors.

"The company was organized as a result of meetings of interested lumbermen held recently at San Francisco, and the following officers are announced: President, W. H. Talbot; general manager, A. A. Baxter; secretary, Charles E. Hill."

The organization of the company is understood to have been approved by representatives of the Federal Trade Commission, who have been on the Pacific Coast for some time.

This event led to the following editorial comment in the *Washington Post*.

"The announcement that Western fir manufacturers representing 80 per cent of the output, are the first in any line of industry to secure permission from the Federal Trade Commission to organize for the development of foreign commerce is an item of peculiar interest. It shows that the lumbermen are running true to form as one of the most progressive bodies in adopting cooperative methods for the enhancement of mutual profit and advancement of American trade.

"There is no other great independent industry in this country so thoroughly organized today on a service basis as lumbering.

"In the general commercial field the lumbermen have a national organization serving as a center, about which cluster in more or less close affiliation numerous independent bodies, each covering its own particular field. The hardwood association endeavors to coordinate the work of all those manufacturers engaged in the production of hardwood lumber and conform to it the requirements of the retailers, as brought out by the National Retail Lumber Dealers' Association. Grades, measurements, shipping rules, freight rates and countless other matters of common interest are worked out in harmony.

"Manufacturers of hemlock, pine, cypress, redwood and other specific lines are organized in separate bodies, each having its own work to perform. In some instances they have established elaborate headquarters, with staffs of experts having charge of broad investigations and novel laboratory and field experimentation. The redwood manufacturers first established by thorough experimental work the suitability of that timber for silo construction; then by cooperative advertising, captured a big share of this growing field. Later the cypress men, finding their timber peculiarly adapted for this use, started out to gather in some of the trade. Curiously enough, though they have developed a profitable business in this line, this has not been done at the expense of the other wood. The combined advertising, rather, has resulted in so great a demand for silos that both organizations are pushed at times to fill their orders.

"Southern gum and Northern hemlock were for many years confined in use to sheeting and other of the cheaper forms of construction. Lately manufacturers of these woods have combined in separate organizations for the discovery of more profitable employment in their products. By careful experimentation they have succeeded, and by well-directed publicity they are obtaining a sale for the higher grades of these timbers for interior finish and flooring. Birch and maple are both represented by strong associations, and there are many other sturdy organizations, each representing some particular district. The White Pine Bureau of St. Paul represents the manufacturers of six Northwestern States. On the Pacific the West Coast Lumbermen's Association represents thirty-seven manufacturers in two States and a Canadian province. The producers of gum in Mississippi and of pine in the Calcasieu District, of Louisiana, North Carolina, Arkansas and other sections have their own organizations, through which they advertise their products and protect their marketing interests.

"Ten congresses and conventions, representing various groups of lumber producers, are to be held within the next thirty days, and these are but a fraction of the total."

Bureau of Mines to Have Exhibit

The Bureau of Mines will have an exhibit at the National Safety Council Exhibition, at Detroit.

H. G. JAMES
Who will speak on "A Federal Oil and Gas Bureau."

SALT WATER IN OIL FIELDS DIFFERS FROM THAT IN OCEAN

The generalization that oil is found in anticlines where the strata are saturated with water and in synclines where the rocks are dry, holds fairly well in the oil fields of the United States, though there are only a few fields in which the latter condition obtains. Thus in the Appalachian fields all but the deepest sands carry water under considerable head, and the oil and gas usually occur in anticlines or on structural terraces. In some localities the sands appear to contain no water, and in these pools the oil may be found in synclines.

The Clinton sand of Ohio, however, seems to carry little water yet the hydrocarbons are usually found in anticlines or structural terraces.

In the Texas and Oklahoma fields the sands generally carry water and the oil and gas usually occur in the anticlines. In California conditions are different, the oil for the most part having migrated from lower formations and collected in porous lenses in the higher beds; it may, therefore, occupy anticlines, synclines or even practically smooth monoclines. The California fields are located in a very arid region, because of the peculiar conditions that have controlled the accumulation of the California oil, it is not practicable to compare these fields (as regards rainfall and relation of oil to this structure), with other fields of the United States.

The fact that oil field water is generally salt water seems to indicate that if the amount of rainfall bears any relation to the occurrence of oil, this relation is not a direct one. The U. S. Geological Survey's investigations in the California fields show that the deeper waters are, as in other oil fields, strongly saline. In some instances they correspond almost exactly with the water of the present ocean, as regards both composition and concentration. The chief differences between these waters and ocean water are (*a*) decrease or complete absence of sulphate in the oil field water, and corresponding increase in carbonate: (*b*) decrease of the magnesium-calcium ratio, the calcium being in many cases more abundant than the magnesium. This water is believed to be essentially connate water—*i.e.*, sea water entrapped in the beds when they were laid down. The decrease of sulphate is probably due to interaction with the hydrocarbon material of the petroleum, by which the latter is oxidized to carbonate, and the decrease in magnesium may be due to dolomitization. Near the outcrop of the beds the water is not a pure connate type, but is mingled with meteoric water, which in that region conatins chiefly sulphates. Under some conditions this sulphate water may be changed to a carbonate water, presumably by the action of the hydrocarbons. Thus the shallower waters in these fields carry chiefly sulphate, while those associated with the oil carry either carbonate or chloride, depending on the proportions in which meteoric and connate waters have entered into their composition.

In the Appalachian oil fields, however, the waters are of very different character, being strong brines or bitterns. Most of these waters are highly concentrated, and the ratio of calcium and magnesium chlorides to sodium chloride is in some cases 1 to 1 instead of about 1 to 4, as in sea water. In these fields, therefore, meteoric water does not seem to have access to the oil bearing stratum, and this condition is probably more common than that which obtains in the California fields. In other words, the very fact that oil can accumulate and remain in the strata during long periods of time indicates that if salt water were originally included in the rocks it would be retained also, and that any extensive incursion of meteoric water would dissipate both. Whether the oil occurs in limestone or in sandstone, it is therefore natural to expect the associated water to be salty.

INDIANA PREPARES TO REVISE MINING CODE IN NEAR FUTURE

Charles Kettleborough, of the Indiana Legislative Bureau, and member of the State Commission on Mines and Mining, was in Washington last month compiling information with regard to laws in other States having a bearing on mining. It is the intention to revise the mining code of Indiana at the next session of the legislature.

ADVANCE IN METALLURGY FACTOR IN PRODUCTION

A feature of the copper industry during the past few years, as is pointed out by B. S. Butler, of the Geological Survey, is the great improvement in metallurgical practices. The blast furnace that was long such a factor in copper metallurgy has been in a large part replaced by the reverberatory.

The great increase in concentrating ore treated during recent years has served to emphasize the lamentably large losses by the older concentration processes.

The flotation process which promises a revolution in concentrating methods will be a very important factor in the 1916 production, Mr. Butler predicts. Leaching, he thinks, will be restricted to classes of ore not susceptible to treatment by the flotation process as at present developed. The improved processes promise to add from 10 to 20 per cent to the metal recovery of concentrating ore, Mr. Butler believes.

Smelter Sampling Discussed

A bulletin descriptive of smelter methods of sampling has been issued by the Arizona State Bureau of Mines.

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RADIUM FOUND IN TWO PRINCIPAL TYPES OF MINERALS

Radium is found in two principal types of minerals—as pitchblende, occurring only in granitic rocks, and in the oxidized minerals which have been formed probably from the breaking down of pitchblende and have been carried to other places in solution. The principal mineral of the oxidized group is carnotite, the yellow and generally powdery mineral which is found in considerable quantities in southwestern Colorado and southeastern Utah.

Other oxidized minerals such as torbernite and autunite are found in the veins which carry pitchblende or in the oxidized portions of thosveins which are thought to have contained pitche blende at one time. They are of little commercial value, although they have been mined as a source of radium in Portugal and South Australia.

COAL MINE OPERATORS OFTEN SELL AT LOSS, MR. LESHER SAYS

The bituminous-coal operator does not as a general rule ascertain carefully the total cost of producing his coal and thus establish a price below which he will not sell, but he usually takes what he can get for his product, probably believing that in dull times it is better to accept a loss in sales than to close the mine, and hoping that he can retrieve his fortunes when conditions are more prosperous, says C. E. Lesher, of the Geological Survey. The contract prices for coal are governed to a considerable extent by the optimism, or the reverse, of the mine operator. During dull times the prices are low, as there is more coal available than is needed, and these prices are somewhat slow in responding to the upward trend when business improves, either because by chance the improvement begins after the period of fixing contract prices or because the change in the tide is not realized or appreciated by the coal trade until it is well on its upward way, Mr. Lesher says.

CALIFORNIA LAW HAMPERS PRODUCTION OF COPPER

The decline in copper production in California is due to a considerable extent to the necessity of eliminating smelter "smoke" ingredients injurious to vegetation, the Geological Survey points out. This has resulted in closing all but one of the smelters in the Shasta County district. California originally was one of the largest copper producing States of the West. At one time it was second only to Michigan in copper production.

DR. M. D. FOSTER
Chairman, House Committee on Mines and Mining.

SUPREME COURT REFUSES TO REVIEW STRIKE CASE

The Supreme Court has refused to review the convictions of four leaders in the 1913 West Virginia coal strike, who were sentenced to six months' imprisonment for contempt of court in failing to obey an injunction by the federal district judge.

The cases are another outcrop of litigation in connection with Judge Dayton's decree that the United Mine Workers was an unlawful conspiracy in its organization and operation. The defendants were members of the union and were found guilty of inciting miners to leave or refuse employment. Their conviction was affirmed by the Fourth Federal Court of Appeals on the theory that Judge Dayton's decree against the United Mine Workers was valid.

The conspiracy case is set for reargument before the Supreme Court during the present term.

The four leaders were Fannie Sullens, Frank Ledvinka, James Oates and Hiram Stephens.

ROUTT COUNTY COAL FINDING MARKET AS FAR EAST AS OMAHA

A good quality of coal is being mined in Routt County, in the northwestern part of Colorado, and several new developments of considerable size are shipping their product out over the line of the Moffat road, recently completed to Craig, on Yampa River. This coal is being marketed as far east as Omaha and it is reported that it has been found to be a good domestic coal.

ARGENTINA IS INTERESTED IN DR. SMITH'S PAPER

To comply with a request made by the Argentine section of the Pan-American Scientific Congress, a translation into Spanish has been made of the paper of Dr. George Otis Smith, Director of the Geological Survey, on "The Public Interest in Mineral Resources." This paper was read by Dr. Smith on the occasion of the conference which was held in Washington last winter.

Latest Legal Decisions

OPTION CONTRACT

An option contract to purchase the mineral resources in and under certain described land underlaid with a coal vein 34 inches or more in thickness is not satisfied or complied with, on the optionee's election to complete the purchase, by a deed purporting to convey coal, "the one mineral resource," without even describing it as of the required thickness, and on the tender of such a deed the optionor or seller cannot recover the purchase price named.

Auten *vs.* Mayor Coal Co. (Kansas), 158 Pacific, 13, p. 14; June, 1916.

EXTRALATERAL RIGHTS

By Section 2322, R. S., U. S., giving locators exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes and ledges throughout their entire depth, the top or apex of which lies inside of the surface lines, although such veins may so far depart from the perpendicular as to extend outside the vertical side lines of the surface locations, Congress contemplated that the locator of a mining claim might discover more than one vein within his surface boundaries and gave him all veins, lodes and ledges throughout their entire depth. If a vein in the form of a single anti-clinical fold may be said to have an apex, there is nothing in the statute which militates against extralateral rights upon such vein in opposite directions, the same as though it were two veins with separate apices instead of one vein. Under such circumstances the locator is entitled to extralateral rights in opposite directions inasmuch as the end lines of his claim must necessarily have two directions, and the statute cannot be construed as limiting end lines to one direction only.

Jim Butler, Tonapah Min. Co. *vs.* West End Cons. Min. Co. (Nev.), 158 Pacific, 876, p. 879; June, 1916.

CONVEYANCE TO CO-OWNER

The purchase of an interest in a mine by one co-owner from another cannot be declared fraudulent and the deed transferring the property annulled and the conveyance set aside on the ground of fraud in the violation of confidential relations and on the ground of the fraudulent concealment of valuable ore bodies known to the purchasing co-owner and unknown to the selling co-owner, where it appears that the purchasing co-owner had the supervision of the operation of the mine and a strained and unfriendly relation had existed between the parties for months, during a part of which time no communications had passed between them, and where the grantor knew that the grantee had previously claimed that the grantor had beaten him out of a large sum of money and where it also appeared that the valuable ore bodies alleged to have been discovered by the grantee and by him concealed from the grantor were known to the grantor and had been known and had been tested for mineral for at least three years and that the ore was not of sufficient magnitude or value to warrant its working as a commercial ore body and that these bodies did not add commercial value, but a speculative value only, to the mine, and that the valuable ore bodies discovered by the grantee were in fact discovered long after the agreement to convey had been reached.

Richardson *vs.* Heney (Arizona), 151 Pacific, 980, p. 984.

RAILROAD RIGHT OF WAY

A person who located a mining claim on the public lands and subsequently abandoned the same as a mining location and immediately returned and established a homestead residence upon the land is not in a position to question the right of a railroad to occupy and use a part of such land for its right of way on the ground that the railroad had no capacity to accept the grant from the government, where the appropriation was made prior to the time it was occupied as a homestead residence, for the reason that by the abandonment of the mineral location the original locator had no interest in the land as a homesteader at the time the railroad acquired its right of way and constructed its road.

Van Dyke *vs.* Arizona Eastern R. Co. (Arizona), 157 Pacific, 1019, p. 1023; June, 1916.

CONTROLLING ELECTIONS

The election of sheriff, county clerk, county assessor and county commissioners for the County of Huerfano, Colorado, in the election of 1914, was declared illegal and the contest sustained on the ground that the proof showed that the Colorado Fuel and Iron Company and the Victor Fuel Company connived with the Board of County Commissioners of the county and with other officials and politicians, and thereby secured the creation of election precincts so bounded as to include the private property only of the coal companies and the lines of the precincts were marked by the fences of the companies or guarded by their

own armed men, these places having been known as "closed camps" within which only the employes of the company were permitted to enter and the public not only excluded but warned that any entrance constituted a trespass. The companies deny the right of free public assemblage within the precincts as established, and the right of free and open discussion of public elections and the right to circulate election literature, and prohibited candidates of one party from entering within the precincts. It also appeared that the coal companies secured the selection of their own employes exclusively as judges of elections and caused the registration lists to be made from their own payrolls and kept them in their private places of business in charge of their own employes, prohibiting all public investigations as to the qualifications of the persons registered as electors of the different precincts. Proof also showed that these coal companies, through their employes, assisted foreigners not familiar with the English language to vote by marking their ballot in violation of law and that the companies furnished or caused to be furnished such voters a fraudulent device by which they could vote for certain persons upon the ticket without being able to read either the name of the candidate or the title of the party ticket. The proof also showed that the activities of the coal companies in control of the elections on election day were so outrageous as to make necessary the presence of a detail of Federal soldiers to protect and escort legal and qualified voters to the polls. The Supreme Court of Colorado, in reversing the lower court, says, in its opinion: "We are unable to find a precedent where like or similar conditions have been considered as in this case wherein private corporations have assumed to deny the pubilc character of an election and to arbitrarily take charge of and conduct the same as if it were the sole private business of the corporation. These companies plainly connived with certain county officials to secure the creation of election precincts, bounded so as to include their private property only, and with lines marked by their own fences, or guarded by their own armed men, and within which were only their own employes. They excluded the public from entrance to such election precincts, labeled the same as private property, and warned the public that entrance thereon constituted trespass. They denied the right of free public assemblage within such election precincts, and likewise the right of free or open discussion of public questions therein. They denied the right to circulate election literature or the distribution of the cards of candidates within such precincts. They secured the selection of their own employes exclusively as judges and clerks of election, and by the location of precinct boundaries no others than their employes could so serve. They apparently made the registration lists from their pay rolls. They kept such lists in their private places of business and in charge of their employes. They prohibited all public investigation within such election precincts as to the qualification of the persons so registered as electors of the precinct. Through their employes acting as election officials they assisted numerous non-English-speaking persons to vote by marking their ballots for them, in plain violation of the law. They provided other non-English-speaking persons with the fraudulent device heretofore described, by which such persons might be enabled to vote the Republican ticket without being able to read either the name of the candidate or the party ticket for which they so voted. They coerced and intimidated their employes in many instances. We find no such example of fraud within the books, and must seek the letter and spirit of the law in a free government as a scale in which to weigh such conduct."

Neelly *vs.* Farr (Colorado), 158 Pacific, 458, p. 466; July, 1916.

STEAM SHOVEL GIVES COAL FIELD NEW LEASE ON LIFE

The mining of coal in open pits by means of steam shovels has become an important feature in the coal fields in Crawford and Cherokee Counties in Kansas. This method of mining has effected large economies in the cost of operation as compared with underground systems and has given these fields, in which the coal beds are thin and expensive to mine, a new lease on life.

THREE STATES PRODUCE 82 PER CENT OF U. S. COPPER

Montana, Michigan and Arizona are the three great copper producing States. Montana ranks first with nearly one-third of the entire output of the country. Michigan is second with more than 26 per cent. Arizona ranks third with nearly one-fourth of the country's copper production.

Utah, which has risen rapidly as a copper producer in recent years, has produced one-sixteenth of the total output of the country. The three first named States, however, have produced 82 per cent of the entire production of the country. These figures were compiled by B. S. Butler, the copper specialist of the Geological Survey.

New Sales Manager Named

F. W. O'Neil, sales manager of the Nordberg Manufacturing Company, of Milwaukee, will sever his connection with the company, November 1, to enter other fields. H. W. Dow, for many years connected with the company in various capacities, has been appointed sales manager.

Mr. Dow is an able engineer, well versed in all kinds of power problems. During his service with the company he has carried out important engineering work.

ARIZONA BUREAU OF MINES PUBLISHES BULLETIN IN SPANISH

Beginning November 1, the State Safety News, published monthly by the Arizona Bureau of Mines, also will be published in Spanish. Inasmuch as the proportion of Spanish-speaking laborers in the mines of Arizona is large, and the necessity for education along safety lines is even greater for these employees than for the Americans, it is felt that considerable benefit will be derived by this means.

BASTIN TO EXAMINE BRADEN MINES IN CHILE

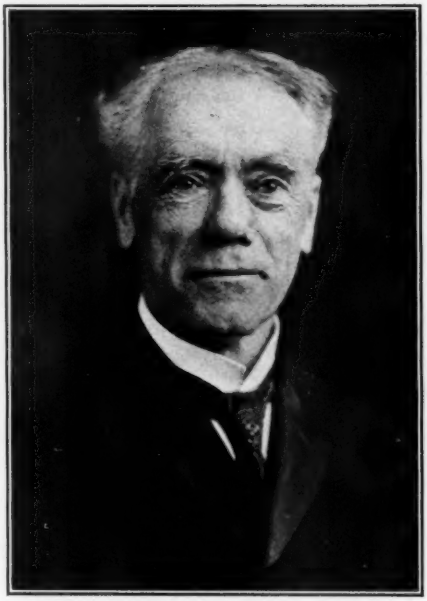
Dr. E. S. Bastin, of the U. S. Geological Survey has been extended a leave of absence for one year, during which time he will make an examination of the Braden Copper Company's mines in Chile. He will be associated in this work with Waldemar Lindgren, the head of the division of geology of the Massachusetts Institute of Technology.

STRIKES HAVE INTERFERED LITTLE WITH COAL PRODUCTION

Within recent years the time lost because of labor strikes has not interfered except locally with the production of coal. The possible effect of a shutdown of the mines during the progress of wage negotiations in the bituminous fields is usually discounted in advance by the storage of coal, and in other years the total possible working days lost because of labor disaffection amount to but 1 or 2 per cent of the total active days.

BUREAU OF MINES LEGAL ADVISER AN AUTHOR OF NOTE

Judge J. W. Thompson, a law examiner of the Bureau of Mines, was born on a farm near Shelbyville, Ind. He continued to live and work on the farm until 23 years of age. During this time he secured such an education as was afforded in the public schools of Shelbyville. Following his graduation from high school, he taught two years in the vicinity of Shelbyville. He then took a course in Hartsville University, followed by a course at Franklin College, and afterwards studied law. He was admitted to the bar and practiced law in Winchester, Ind., where he continued this work for twenty-one years. During this time he did a great deal of law editorial work, which led finally to his acceptance of a position as editor and law writer with the Bobbs-Merrill Company, law-book publishers of Indianapolis. Here he spent ten years, during which time he gave special attention to and wrote extensively on mining law for the technical mining press. It was through these writings that he became known to the Director of the Bureau of Mines and this led to his appointment as law examiner for the Bureau. He came to the Bureau April 1, 1911, and has continued with it since.



JUDGE J. W. THOMPSON
Chief of legal division of the Bureau of Mines.

Judge Thompson has been a prolific writer and is the author of thirty-two volumes, some of them containing as high as 1,600 pages each. His principal publications are: "Thompson on Corporations," a nationally known work; "Thompson's Ohio Trial Evidence," considered a classic in Ohio; "Thompson's Indiana Forms;" "Notes on Indiana Decisions," and "United States Mining Statutes Annotated," which made the Federal Mining Law readily available for the first time.

CHEMICAL INDUSTRY NOT READY FOR MORE STATISTICS IT APPEARS

A circular recently was sent out by the Geological Survey to the producers of aluminum salts. These producers were asked if they could make use of more diversified statistics on aluminum salts. They were asked to indicate what divisions in the present statistics would enable them to have a better understanding of the industry. Only 25 per cent of the manufacturere replied. This is taken at the Survey to indicate that the industry is not ready for more detailed statistics at this time. This applies to practically the entire chemical industry, it is believed.

CLARK MAY ATTEND CHICAGO CONVENTION

Will L. Clark has resigned as manager of the United Verde Copper Company, a position he has held since 1904. The resignation has been accepted with the keenest regret by both Senator W. A. Clark and his son, Charles W. Clark, who is general manager of the Clark interests in Arizona. Will Clark will devote his time to several companies in which he is interested in Arizona and also to interests in Montana. For some years Mr. Clark was a director of the American Mining Congress, and has always taken a deep interest in its work. Whenever possible he attends its annual convention and has now promised to participate in the proceedings of the Congress at Chicago in November.

Since 1889, Will L. Clark has been connected with the organization of Senator Clark, rising steadily until he became assistant manager of the Clark mines at Butte. As a result of his splendid management these mines had the reputation of being the safest in the district.

In 1904, Mr. Clark came to Jerome, Ariz., as manager of the United Verde. Some of the most effective mine safety methods in use today originated and were perfected under his management at the United Verde. In 1907, Mr. Clark was named Chairman of the Arizona Mining Code Commission which, after three years of preparation, study and compilation, presented the measure which is today known as the Arizona Mine Inspection law.

ALL CLASSIFICATIONS OF COALS ARE UNSATISFACTORY

All classifications of coals are more or less unsatisfactory, the lines of division being necessarily arbitrary. As a practical and sensible, as well as a very simple working basis, Campbell's differentiation of peats, lignites, subbituminous and bituminous coals, is used by the Geological Survey. The discrimination of semibituminous, semianthracite and anthracite is based upon the Pennsylvania system.

David White, chief geologist of the U. S. Geological Survey urges a study of the coals from the standpoint of the content of oxygen in the water-free combustible matter, the oxygen-content being the most important index to progressive devolatilization of the ordinary run of coals and so of the rank of the coal.

ELECTRIFICATION OF C. M. & ST. P. AFFECTS MONTANA COAL MINES

The demand for Montana coal for railroad fuel, particularly for coal from the Roundup field in Musselshell County, has been curtailed by the electrification of a portion of the Chicago, Milwaukee & St. Paul Railway, but this was offset during the second half of the year by a good market for coal for domestic and commercial uses.

TURN TO OIL SHALES AS OIL SUPPLY BEGINS TO FAIL

An investigation now in progress by the Geological Survey and the Bureau of Mines is looking ahead to the time when the present increase in petroleum production will give place to a general decline. Already in no less than eleven States, the crest of the wave of production seems to have passed, although the States of Oklahoma, and Wyoming with increasing yields are more than offsetting the decline in the other States.

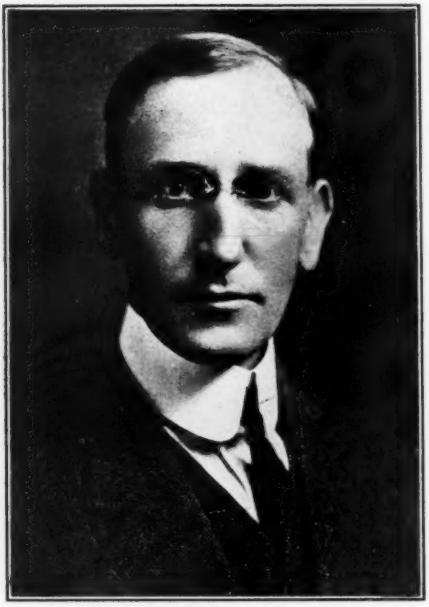
In view of the rapidly growing demand for gasoline and other petroleum products it does not seem too early to be taking account of stock for the future. Therefore, in addition to the attention being given to increasing our geologic knowledge bearing on the possible extension of oil fields, the Geological Survey has begun to study the bituminous and oil shales.

One belt of black shales extends from New York to Kentucky and Tennessee. Another large area is in Colorado, Utah and Wyoming. These vary in richness. In Utah the bituminous shale from one bed yields as high as two barrels of oil to the ton. The black shale at New Albany, Ind., yields on distillation only 7 to 12 gallons of oil to the ton. Elsewhere in Indiana and Illinois the shale overlying one of the coal beds has yielded one-third to one-half barrel and this shale is being removed in stripping the coal and is thus at present a waste product. While this source of oil is not promising under present conditions, yet we are learning how wide spread are these occurrence of oil-bearing rocks and how large in the aggregate is their content of oil. Dr. Ashley, for instance, has figured that one bed of this shale in Indiana contains 100 billion or more barrels of oil.

Bituminous shales were utilized abroad before Pennsylvania oil was discovered and their distillation may be a part of our chemical industry at some future day, and indeed that day may not be far distant, so rapid is the industrial development of today.

INCREASED USE OF MACHINES TO COME IN ANTHRACITE FIELDS

Prior to 1911 the quantity of machine-mined anthracite in Pennsylvania was negligible. Although mining conditions, particularly in the southern part of the anthracite field, are unfavorable to the use of the types of machines now employed in the soft-coal regions and the attitude of labor has not encouraged their introduction, it seems inevitable that the operators, in the face of increasing cost of mining and with an economic limit beyond which, because of competition with soft coal, gas, and coke, prices cannot be further raised, will within the next few years be obliged to adopt and adapt mining machines, for by no other means can material economies in cost of production of anthracite be effected in the opinion of Geological Survey experts.



FREDERICK LAIST

Chemical Expert, Anaconda Copper Company, who will speak on "Electrolytic Separation."

CONDITIONS IN MID-CONTINENTAL FIELD EXPECTED TO IMPROVE

Reporting on conditions in the Mid-Continental oil field the Federal Reserve Board's report says:

"There has been a perceptible slackening in development operations throughout the mid-continent oil field since the recent curtailment in runs by the pipe-line organizations and the decrease in the price of crude oil, yet it is the general belief in oil circles that conditions can not help but steadily improve. Uncontradicted rumors are that a large foreign corporation of immense resources will soon begin the erection of a pipe line crossing Oklahoma and Kansas and running to St. Louis. The general belief in this action is one of the factors contributing to the present confidence. Reserve stocks of petroleum are said to be the lowest in history, while there is undoubtedly a rapidly multiplying demand for all classes of petroleum products. Mid-continent production for the first week in September showed a decrease of 120,000 barrels daily from the recent high record. The Cushing (Okla.) production is now at the rate of 63,150 barrels a day, whereas this pool produced over 325,000 barrels daily at its best point in 1915. Since July 24, there have been seven distinct reductions in the price of crude oil, the total reduction being 65 cents, and the present price, which has prevailed since the latter part of August, is 90 cents.

"Activity continues in the Wyoming oil fields, where large amounts are being invested. The valuation in the oil fields of that State has increased from $1,446,478 to $2,572,422 between this time last year and the present, and the increase is growing rapidly."

COAL TAR DYES FEATURE OF CHEMICAL SHOW

Without question, the principal feature at the Chemical Show at New York was the exhibit of American coal tar dyes, according to James H. Hill of the Geological Survey. The contrast between the exhibit this year and the exhibit of last year is very striking, Mr. Hill states.

"The whole show was remarkable," said Mr. Hill, "when it is compared with the exhibition of a year ago. It is a clear indication of the remarkable progress that has been made by the chemical industry during the past year. One of the things which impressed me was the diversified nature of the products exhibited. So many of the salts which formerly were obtainable only abroad are now being manufactured in this country, as was strikingly set forth at this exhibition.

"Personally, I was most greatly interested in the barium and strontium salts. Before the war, practically all barium salts used in this country were imported. During 1915, 8,000 tons were manufactured domestically. This amount is steadily increasing since the last figures were compiled, and I predict that within the next two years American manufacturers will be able to supply the entire domestic demand. Another promising feature is that this manufacturing is not confined entirely to one part of the country. While the principal factories are in the East, other factories are springing up in other sections of the country.

"Particular attention seems to have been directed to the exhibit of silica glassware. It seems to be the consensus of opinion that this product has a future.

"Chemists and assayers were particularly interested in the improved balances which were on display. The improvement in this important part of the equipment of a laboratory or assay office indicates a great step forward."

Iowa Mines Not Holding Their Own

The largest use for Iowa coal is by railroads and for domestic purposes, as Iowa is primarily an agricultural State crossed by many of the western trunk lines. That the production of coal in this State, which for ten years has ranged between seven and eight million tons, has not kept pace with the increase in population and in railroad activities owing to the inroads that coal from other States, both east and west, have made on the natural markets for Iowa coal.

Latest Mining Patents

REFINING METHOD AND APPARATUS

No. 1,199,903. This invention is by Arthur Neal Kerr, of Tulsa, Okla.

This invention relates to a method and apparatus for treating lighter runs of oil well products and particularly to a method and apparatus to treat casing-head gasoline, whereby all of said gasoline is utilized and separated and whereby the entire process of separation into various fractions may be carried out in a single operation.

It is an object of the invention to provide a method and apparatus for first distilling and then separating casing-head gasoline or the like, and in one operation employing its light fractions or "tops" to enliven a low-grade product, thus increasing the value of such product and at the same time save the "tops." It is another object of the invention to provide a method and apparatus where the entire process of treatment of casing-head gasoline or the like may be carried out in a single operation and under very moderate pressure.

ORE CRUSHER AND CONCENTRATOR

No. 1,200,104. This invention is by Charles O. Haskell, of Los Angeles, Cal., assignor to Centrifugal Machinery Company of Los Angeles, Cal., a corporation of California.

This invention relates to crushing, pulverizing and concentrating machines, and more particularly to a machine of this nature especially adapted for handling ore in such fashion that it will be crushed, pulverized and separated, the concentrates being discharged at one point and the tailings at another point.

One of the objects of the invention is to provide a strong, substantial and very efficient and practical crushing and concentrating machine, which will readily handle ore in any form, and which will crush, pulverize and separate ore so that the concentrates may be discharged through one opening and the tailings and dust through another opening. A further object of the invention is to provide a machine in which many of the parts are both reversible and interchangeable, and a machine which may be easily assembled, and in which worn parts may be easily removed and renewed.

OPERATING AND RECLAIMING OIL-WELLS

No. 1,200,423. This invention is by William Daniel Huff, of La Fayette, La., assignor of three-fourths to Louise Guidry Moss, of New Iberia, La.

This invention relates to improvements in operating and reclaiming oil wells. It is the purpose of this invention to expedite the flow of oil in those wells in which the flow has already begun to diminish, and to reclaim those oil wells in which the flow has already ceased due to the thickening of the oil around the opening, owing to the presence of paraffin, or other causes.

According to this invention the interior of the well, near the bottom, is heated with any hot fluid, for instance as air, which is preferably used in the regenerative way, and this heat not only serves to thin the oil in the veins, permitting it to flow from the oil bearing strata into the well, but also generates steam or other gas pressure in the well, which depresses the fluid in the well from the static head down to a point below a series of steam ejectors, carried by pipes mounted in the well, which add the dynamic effect of the ejector to the lifting effect of the pressure in the well, and thus lift the oil or other liquid in the well through the casing and deliver it to a delivery pipe.

EXTRACTING METALS FROM ORES

No. 1,200,832. This invention is by John C. Greenway of Warren, Ariz.

This invention relates to improvements in apparatus for extracting metals, preferably copper, from their ores by leaching in such a manner as to obtain a good extraction and at the same time maintain the solution low in impurities in order that the copper can be economically separated without further preparation or purification.

The chief object of this invention is to provide a means for leaching a series of bodies of ore, such that the leaching solution will be discharged from the last body substantially neutral, thereby requiring a minimum amount of acid and giving a very efficient extraction of the metal and at the same time to remove impurities from the solution, thereby facilitating the separation of the metal from the solution.

ROCK DRILL

No. 1,200,935. This invention is by August Gerdes, of Gretna, La.

This invention relates to rock drills and has particular reference to a drill which is adapted for use in boring oil and artesian wells and the like, but it will be understood that certain features of the same are adapted for use in rock drills generally.

The object of the invention is to generally improve this form of drills and provide a connection between the drill or bit and the drill head by means of which a wabbling motion as well as a rotary motion can be given to the drill. Such a motion is preferable when boring rock or other hard substances because when the drill strikes an obstacle it will not break or injure any part of the drill but will immediately begin to wabble and wear away the obstacle in this

manner. The material loosened by the bit on the drill head is then flowed out of the well by water which is pumped in through the body of the drill.

ORE CONCENTRATING APPARATUS

No. 1,201,053. This invention is by Thomas A. Janney, of Garfield, Utah.

This invention has for its object the improvement of apparatus used in the concentration of ores by the oil flotation process, in which process the ore mixed with water in the form of a freely flowing pulp is agitated with oil and other reagents, if such are necessary or beneficial, with the result that the metalliferous part of the ore is caused to float when the pulp is removed from the zone of the agitation and permitted to assume a condition of substantial quiescence. This process can be carried out in many different forms of apparatus, but the apparatus forming the subject-matter of this invention possesses several distinct and novel advantages.

MINE CAR

No. 1,199,794. This invention is by Warren V. Johnson, of Bloomsburg, Pa., assignor to American Car and Foundry Co., of St. Louis, Mo., a corporation of New Jersey.

According to this invention a mine car should be light, strong and durable, possessing inherent qualities of elasticity to adapt it to resist service shocks, and it should be so fashioned that it can be readily repaired in such parts where repairs are most frequently required.

For the bituminous regions it has been found advisable to employ wood in cars, particularly in mine cars, and the present invention contemplates the employment of wood flooring extending through and beyond the body portion to form end bumpers of a composite type comprising the portions of the floor which extend beyond the body cooperating with wood bumper blocks and end bumper bands of metal which fit over the ends of the floor and bumper blocks.

PROCESS OF DISTILLING PETROLEUM

No. 1,199,463. This invention is by Altis S. Hopkins, of Neodesha, Kans., assignor to the Standard Oil Company, of Neodesha, Kans., a corporation of Kansas.

This invention relates to the art of distilling mixed liquids. The invention is especially concerned with the destructive distillation or cracking of relatively heavy or high boiling point hydrocarbon oils to produce therefrom lighter or lower boiling point products, as carried out, for instance, according to the method disclosed in the patent to William M. Burton, No. 1,049,667, of January 17, 1913.

Report Soon on Georgia Kaolin

A paper on Georgia kaolin by Ira E. Sproat will be published within the next few weeks by the Bureau of Mines.

RAILROADS ARGUE COAL CASE BEFORE SUPREME COURT

A series of briefs for defendants in the so-called Reading and Lehigh Valley coal trust suits, denying the Government's charges that monopolization of production and transportation of anthracite coal has been effected by these companies in their respective territories, have been filed in the Supreme Court. The cases were argued before a full bench.

The Reading Company and the Central Railroad of New Jersey declare in their briefs in the Reading case that only about 20 per cent of the anthracite trade they are charged with monopolizing, actually is controlled by them, and denied that any question of restraint of trade was involved in Reading's acquisition of a majority of the stock of the Jersey road in 1901.

In the Lehigh Valley case briefs were filed by the Lehigh Valley Railroad, the Lehigh Valley Coal Company, the Lehigh Valley Sales Company, the G. B. Markle Company and individual defendants. Conceding that stock of other coal companies was acquired by the Lehigh road to protect its anthracite tonnage, they asserted that this was done in furtherance and not suppression of coal competition.

Competition of the Reading, Erie, Delaware and Hudson and Lackawanna interests, it is declared, made necessary, with the approval of the State of Pennsylvania, the acquisition of coal properties.

"At the present time," said the Lehigh road's brief, "the Lehigh Valley Coal Company owns, or controls, but 10.3 per cent of the total anthracite acreage in the three contiguous regions in Pennsylvania—the Wyoming, Lehigh and Schuykill—and but 22.3 per cent of the acreage naturally tributary to the Lehigh Railroad. That is not monopoly."

It is asserted that coal transportation has become vital to continued existence of the Lehigh Railroad. Defending acquisition of the Delaware, Susquehanna and Schuylkill Railroad, the Lehigh Company's brief asserted that there was little competition between them.

DEATH CLAIMS TOWERING FIGURE IN MINING WORLD

Adolph Zang, for years president of the Vindicator Consolidated Mining Company, of Cripple Creek, Colo., died at his home in Denver, September 28.

Mr. Zang was a member of the American Mining Congress and was deeply interested in its work. He was one of a group of investors whose faith in the future of Colorado's mining industry did not falter during its darkest days.

It was due to men like Zang, Campbell and Sigel, all now gone to the Great Beyond, that capital continued to flow into Western mining channels. They all were rewarded amply for their faith. Two years ago Mr. Zang and his associates were responsible for one of the largest mining consolidations in the Cripple Creek district.

Latest Traffic Developments

In case No. 7176 before the Interstate Commerce Commission, the Tennessee Copper Company *vs.* Southern Railway Company, the decision is summarized as follows:

1. Rates for the transportation of nitrate of soda in carloads from Charleston, S. C., and Savannah, Ga., to Copperhill, Tenn., found unreasonable, and reasonable maximum rates prescribed for the future.

2. Rates for the transportation of nitrate of soda in carloads from Pensacola. Fla., and New Orleans, La., to Copperhill, Tenn., not found unreasonable or unjustly discriminatory.

3. Rate of 82 cents per 100 pounds for the transportation of nitric acid in carloads from Great Falls, S. C., to Copperhill, Tenn., not found unreasonable.

4. Rate of $1.80 per ton for the transportation of coke in carloads from Josephine and Dorchester Junction, Va., to Copperhill, Tenn., not found unreasonable.

5. Rates for the transportation of lumber, logs, poles, and crossties in carloads from Murphy, N. C., and Ellijay, Sweet Gum, and McCullough, Ga., to Copperhill, Tenn., not found unreasonable.

6. Rates for the transportation of lead dross and pig lead in carloads from Copperhill, Tenn., to Baltimore, Md., and other points, mentioned in the report, and for the transportation of sheet lead in carloads from Baltimore and some of such points to Copperhill, not found unreasonable.

7. Rates for the transportation of pig lead in carloads from Copperhill, Tenn., to Atlanta, Ga., and for the transportation of sheet lead in carloads from Atlanta to Copperhill, found unreasonable, and reasonable maximum rates prescribed for the future.

8. Rates for the transportation of copper bullion in carloads from Copperhill, Tenn., to Baltimore, Md., and Perth Amboy, N. J., and to certain Virginia and south Atlantic ports mentioned in the report, not found unreasonable or unjustly discriminatory.

9. Rates on interstate shipments of coal in carloads from groups A, B, and E, on the line of the Louisville & Nashville Railroad Company, to Copperhill, Tenn., not found unreasonable or unjustly discriminatory.

St. Louis Rate Upheld

In the case No. 7649 of the Coal Operators' Traffic Bureau of St. Louis *v.* Baltimore & Ohio Southwestern Railroad the Interstate Commerce Commission found that the rate charged for the transportation of bituminous coal from group 2 points in Illinois to St. Louis, is not unlawful.

Drawback Allowed

Drawback has been allowed under paragraph O of section 4 of the tariff act of October 3, 1913, and the drawback regulations (chapter 18 of the Customs Regulations of 1915) on metal powder manufactured by the Nassau Smelting & Refining Works, of New York, N. Y., with the use of imported antimony.

EFFORTS OF EDITOR IMPROVES GRADE OF TECHNICAL COMPOSITION

Most commendatory reference is being made throughout the country to the revised edition of "Suggestions to Authors" by George McLane Wood, editor of the Geological Survey.

During his many years' service with the Geological Survey, Mr. Wood has been laboring tirelessly to reduce scientific writings to an easily understandable plane. In addition he has done a great deal to increase the literary standing of the scientific papers which the Survey is issuing continually.

Formerly, perhaps more than at the present, the criticism was heard frequently that many scientific writers have a poor literary style. In addition scientific writers are continually tempted to fall into the use of technical terms and expressions which greatly limits their field of readers. In endeavoring to overcome this objection Mr. Wood is credited with having done a very remarkable service to the Survey and to those in whose interest its work is done.

Instructors in English and writers of note are among those who have written the Director of the Geological Survey complimenting the Bureau and Mr. Wood on the excellence of this latest publication. Frank H. Vizetelly, managing editor of the Standard Dictionary, says in part: "It is a treatise which I prize highly for never have I seen one which treats the subject so ably and comprehensively." Brander Matthews, the celebrated writer who resides in New York City, says, "Your 'Suggestions to Authors' are excellent." A long list of other persons including U. P. Hedrick of the New York Agricultural Experiment Station; Charles C. Adams of the New York College of Forestry; Prof. Chas. B. Berkly of the Columbian University and Jos. Hyde Pratt, the State Geologist of North Carolina, have made complimentary reference to the work.

DEVELOPMENT OF WATERPOWER CURTAILS USE OF ALABAMA COAL

In ordinary times Alabama supplies a large quantity of coal for steamship bunkers at Pensacola, Mobile, Gulfport, and New Orleans; but since the European war began there has been little call for coal for that purpose at those ports. The development of water power on a large scale in Alabama has also cut off the market for a large quantity of coal. The opening of Warrior River to navigation was expected to offer an outlet for large quantities of coal to New Orleans and Mobile ports, but in 1915 there was no demand from those sources and a comparatively small quantity of Alabama coal found markets over that waterway.

J. C. McDOWELL

Who will speak on "Geology in its Relation to the Oil Industry"

POTASH BEING PRODUCED AT VARIOUS PLACES

Production of potash in commercial quantities is in progress near Marysvale, Utah. It is being produced also from the alkali lakes of Nebraska. It is obtained as a by-product in the manufacture of Portland cement at Riverside, Cal. It is taken from the brines of Owens Lake, Cal., and secured from kelp along the Pacific Coast.

Production in the near future from various other sources is frequently promised and experiments are continually being made. One line of experiments which has been attracting considerable attention for some time is the extraction of potash from feldspathic rocks. Chemical engineers interested in this phase of the subject are of the opinion that feldspathic rocks containing from 10 to 12 per cent potash may be utilized to advantage eventually, but at the present time there has been no process perfected for such extraction in commercial quantities.

Potash salts, which before the European war sold for about $40 per ton, now bring in the neighborhood of $500.

ALTITUDE OF CALIFORNIA OIL FIELD RUNS UP TO 3,000 FEET

The altitude of oil wells in California varies greatly, the range being from sea level to 3,000 feet above it. The depth of the wells also varies, depending upon the structure of the oil sands, that is, the way those sands are bent and not upon the position in the State. The depth varies from a few feet to as much as 5,000 feet.

The Lakeview well, which was the largest well ever brought in in California, has an altitude above sea level of about 700 feet, and was drilled to a depth of about 2,200 feet.

The altitude of the surface in the oil fields of Texas ranges from a few feet along the coast to about 1,000 feet in the northern part of the State, and nearly 1,500 feet in Palo Pinto and Shackleton Counties. The depth of producing wells ranges from 200 or 300 to about 3,000 feet.

Oil wells in the vicinity of Olean, N. Y., vary in altitude from about 1,550 feet on the head of Fourmile Creek to above 2,300 feet at Rock City and Flatiron Rock. It is believed that the oil-bearing sand is the Bradford and that the depth, varying with the location of the wells, is 1,200 to 2,200 feet.

DR. HENRY MACE PAYNE

Who will give an illustrated lecture on "Frozen Gravels in Alaska nnd Siberia"

PLATINUM SURPRISE DUE SOON, IT IS CLAIMED

A very important development in the platinum situation is expected shortly. Those who are acquainted with this industry in South America declare that a surprise is certain to come very soon. As yet the matter has not ripened sufficiently to justify publication, they claim.

Platinum experts are having difficulty in explaining the recent decrease in the price of platinum. Some are of the opinion that so much uncertainty surrounds the platinum market that the arrival of an unusually large shipment from South America sent the prices off for the time being.

Dr. Parsons on Government Mission

Dr. Charles L. Parsons, chief of the division of Mining Technology of the Bureau of Mines, sailed October 6 for Europe to make an investigation of nitrate plants. This investigation is being made in preparation for the erection of a nitrate plant by the United States Government.

R. W. Pack of the Geological Survey has gone to California on an oil investigating trip.

George H. Wigmore, of Los Angeles, has been in the East recently gathering information as to the possibility of marketing low-grade tungsten ores.

A. C. Veatch, an American geologist connected with the Aguila Oil Company, was in Washington recently. Mr. Veatch is regarded as one of the foremost American oil experts. He is an authority on oil occurrences in Algiers, Morocco, and other countries in northern Africa.

D. F. Hewett, of the Geological Survey, is in Wyoming finishing up a report on the Big Horn Basin.

B. S. Butler, of the Geological Survey, returned from several months' work in the Cottonwood lead and silver district of Utah. A detailed examination of this region is under way.

Harry S. Coe, of the Dorr Machinery Company, was in Washington recently. He is engaged in chemical experiments in New York at present. Mr. Coe is well known in mining circles in Mexico and Central America.

F. W. Clarke, chief chemist of the Geological Survey, has returned from Maine where he has been conducting some investigations.

B. Bryan, a well-known geologist, is en route to Argentina where he will conduct some investigations in the northwestern portion of that country.

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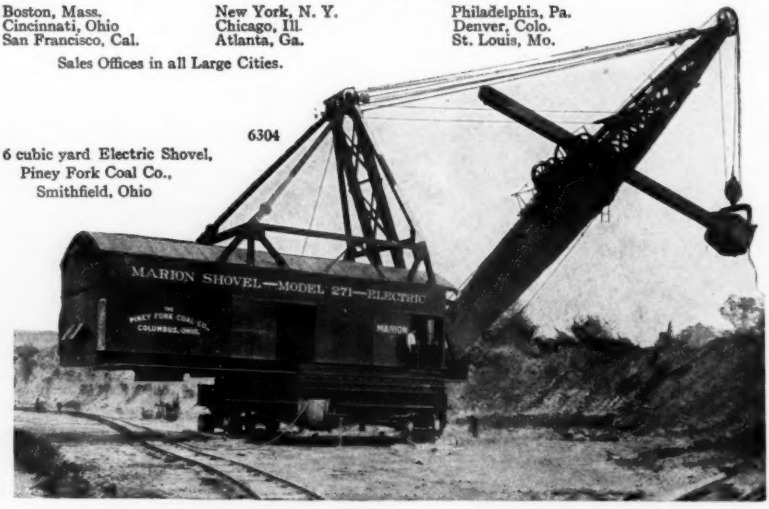

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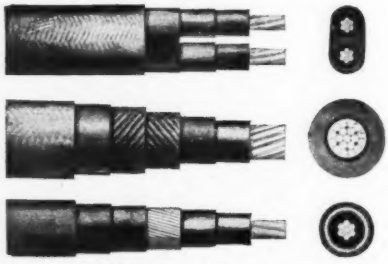

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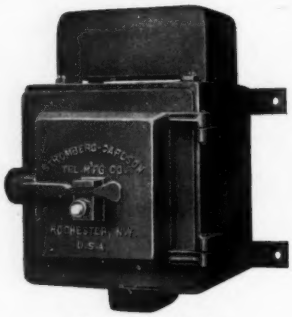

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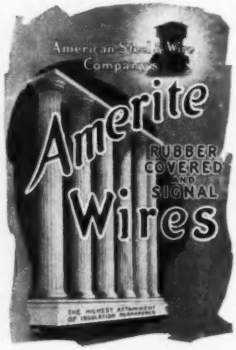

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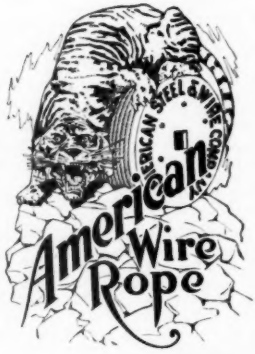

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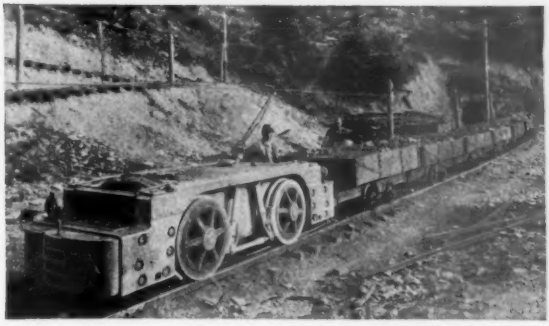

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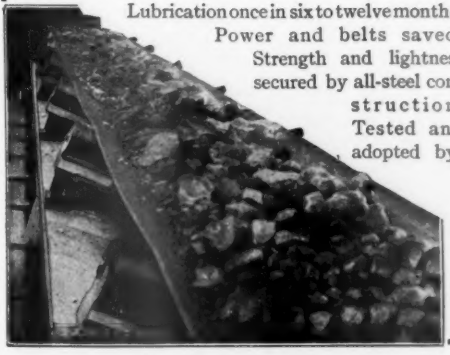

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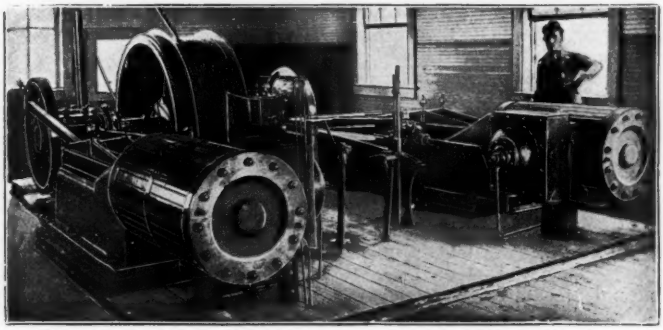

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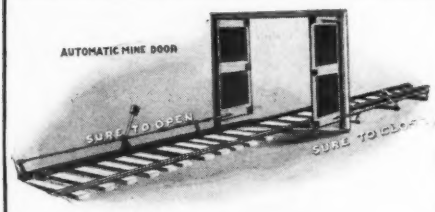

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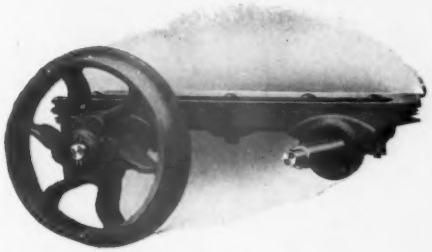

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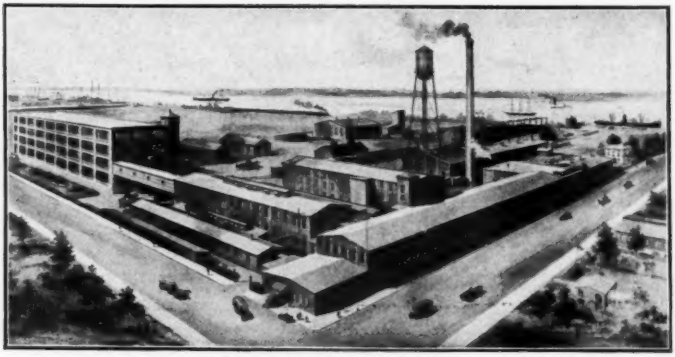

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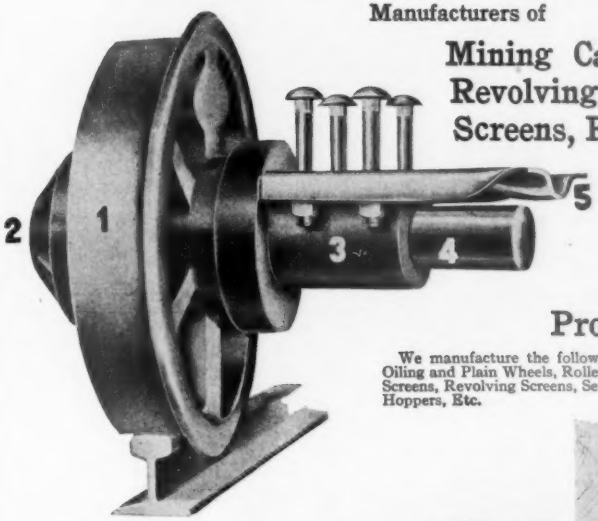

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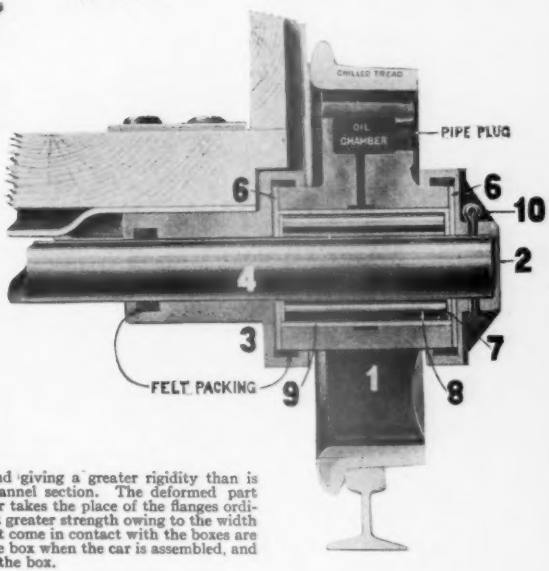

Is constructed with pressed steel channels that hold the boxes in perfect alignment, running all the way across the car and thus preventing them from getting out of line. It has the bolts running through the bottom of the car, going through the axle boxes, pressed steel channels and wooden bottom, and the heads are protected on the inside of the car by a washer also, which does not allow the bolts to wear the wood and cause the axle to get out of line. The pressed channels are not of the ordinary rolled type channel, but are made from ¼-inch plate, and the deformed part of the channel in the center gives it greater strength and also wider bearing on the bottom of the car, allowing the bolts to be placed further apart and giving a greater rigidity than is accomplished by the ordinary rolled channel section. The deformed part of the channel that is formed in the center takes the place of the flanges ordinarily used, and in addition to this gives it greater strength owing to the width of this deformed section. The flanges that come in contact with the boxes are driven down tight on either side of the axle box when the car is assembled, and there is no play between the channel and the box.

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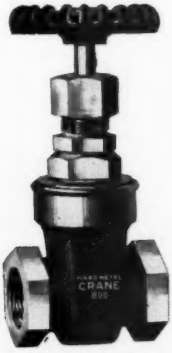

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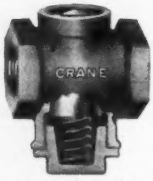

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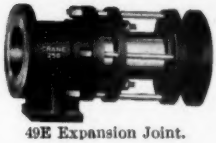

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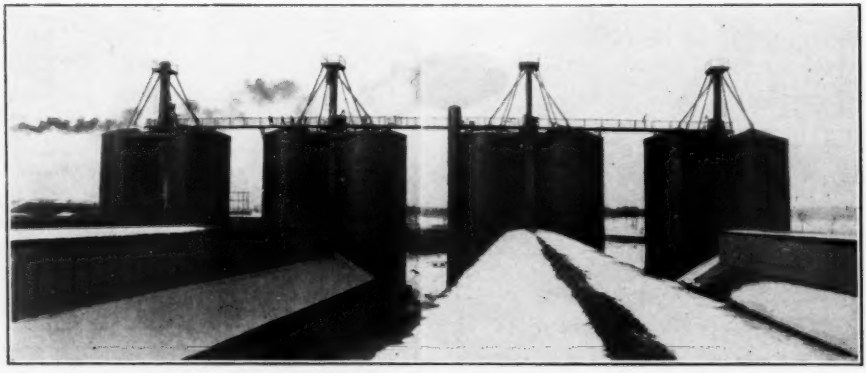

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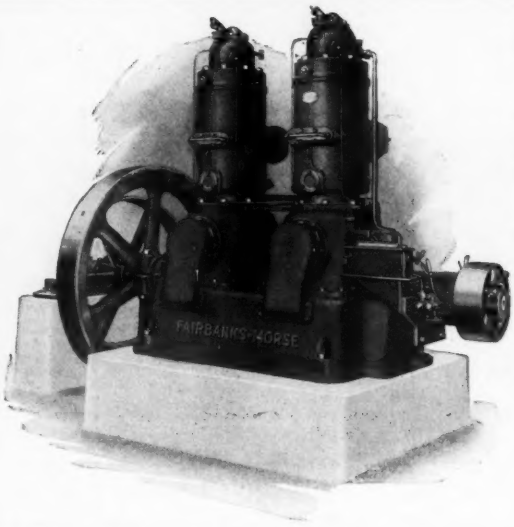

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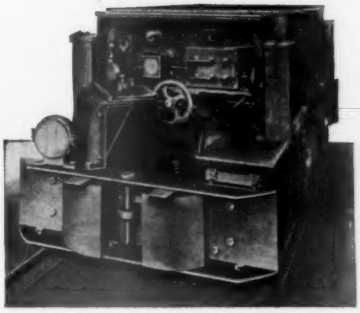

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THIS Company, the largest Central Station in the world generating its power from coal, maintains from 250,000 to 275,000 tons of coal in reserve on the grounds near the various stations for emergency use. This is done for service protection in case of a coal shortage due to railroad congestion or interruption of coal deliveries due to any cause.

THE various stations of this Company consume approximately 250 tons of coal per hour—a daily total of approximately 6,000 tons—more than two million tons of coal per year. This coal is being continually brought in carloads direct from the mines.

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6,500 Tons Daily Capacity
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Designed expressly to meet the working conditions and service requirements of storage battery operation, the

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has won instant and universal recognition of its exact suitability and real mechanical rightness

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The principal features of special advantage lie in, or result from, or are accompaniments of, the *Articulated Construction*, whereby every essential of truly efficient performance and service is readily secured and assured.

Bulletin 521-*M, Just Out, Tells the How and Why*

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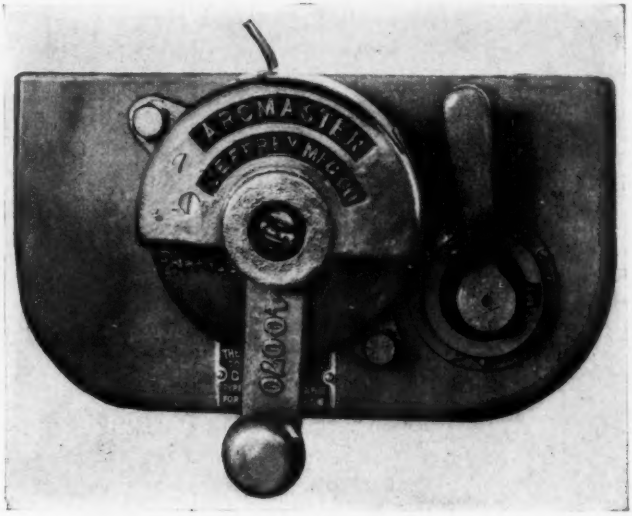


Cost of Controller Upkeep is Reduced--Operation of Locomotive is Made Safer by the New JEFFREY "ARCMASTER"

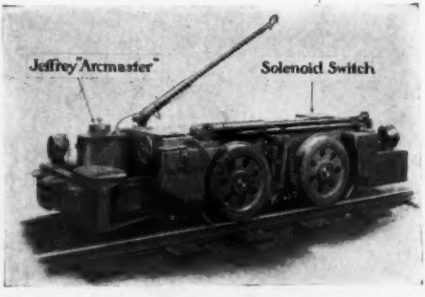
A Feature Exclusive to Jeffrey Locomotives.

Eliminates all arcing from controller cylinder, burning of fingers or contacts on main cylinder.

The "Arcmaster" controls the operating coil of a rugged Contactor Solenoid Switch mounted anywhere on the locomotive, where it can be protected from mechanical injury.

Consists of control switch ("Arcmaster") mounted on top of controller which serves as a handle and works in conjunction with the standard controller cylinder.

A Standard Equipment on all Jeffrey Locomotives above four tons in weight. Write for further particulars.



The Jeffrey Mfg. Co.

958 North Fourth Street

Columbus, Ohio

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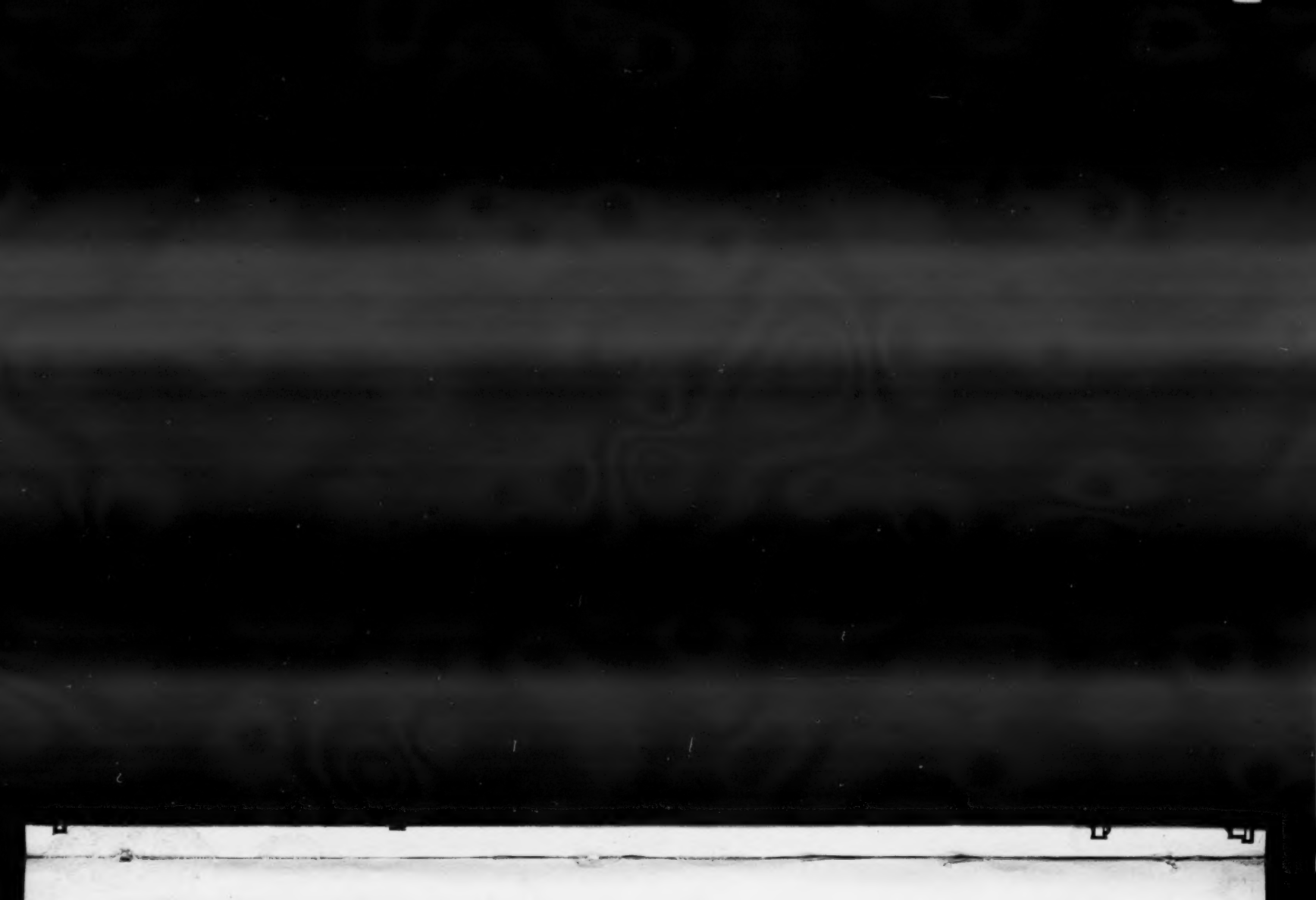
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